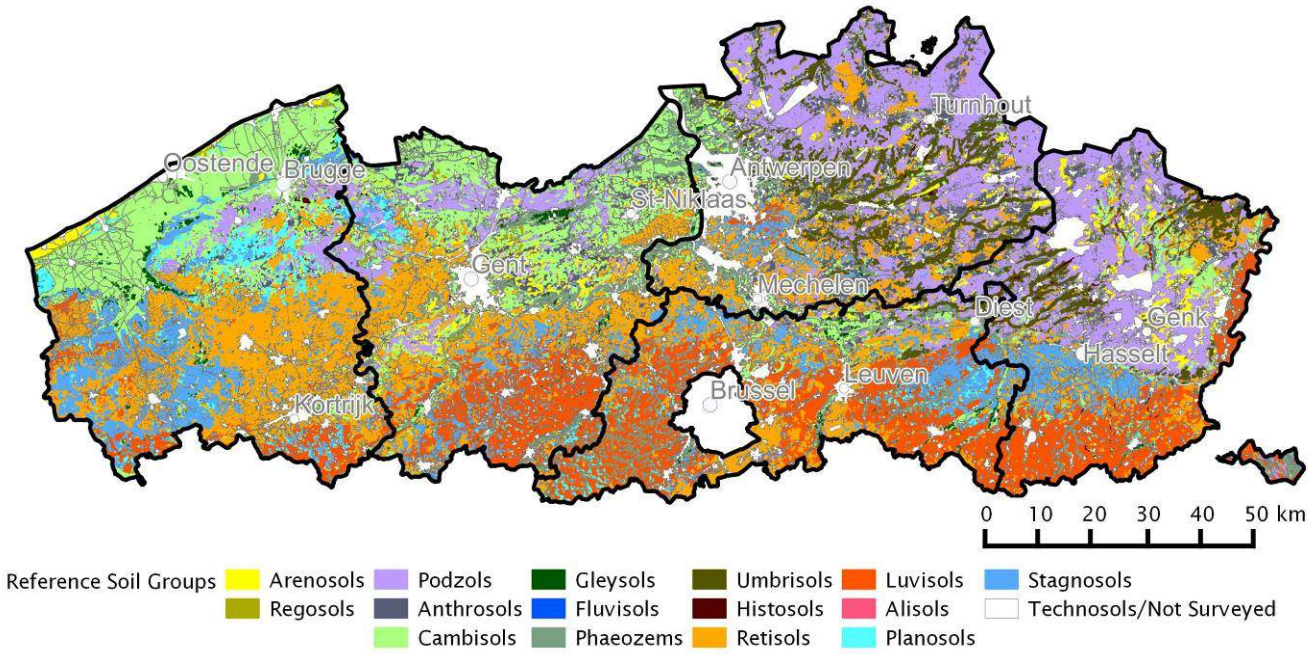
UNIVERSITEIT GENT

KU LEUVEN

Ontwikkelen en toepassen van een methodiek voor de vertaling van de Belgische bodemclassificatie van de kustpolders naar het internationale WRB systeem en generaliseren van de WRB-bodemkaart voor gans Vlaanderen naar het 1 : 250 000 schaalniveau

The soil map of the Flemish region converted to the 3rd edition of the World Reference Base for soil resources



Stefaan Dondeyne, Laura Vanierschot, Roger Langohr

Eric Van Ranst* and *Jozef Deckers

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Contents

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Taking the elaboration and testing of the methods into account, this project took more than four years. If this may seem long, one should consider that hundreds of people have contributed to the original soil survey work carried out over more than 40 years. By now disclosing the soil maps with an international legend, we hope that this enormous work will be valued even more and eventually will contribute to better land management.

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Stefaan Dondeyne
Leuven

Abstract

The legend of the detailed soil maps (scale 1 : 20 000) of the Flemish region has been converted to the 3rd edition of the World Reference Base for Soil Resources (WRB). WRB is the international soil classification system which has been adopted to harmonize soil information data within Europe. The objective of the current assignment was to complete the systematic conversion of all the detailed soil maps including the coastal area such that these can be presented on maps at a 1 : 20 000 to 1 : 50 000 scale and can be generalized to produce maps at a 1 : 250 000 scale.

The legend of the soil map of Belgium is based on soil texture, drainage status and profile development, while the WRB classification is based on diagnostic features defined by morphological, physical and chemical properties. For the Flemish region there are more than 4000 different soil types (or mapping units) recognised. To take regional variability into account, the classification of these soil types has been done for 24 soil districts. Overall 16 *Reference Soil Groups* have been identified. More specific properties on these *Reference Soil Groups* are indicated with up to three *Principal Qualifiers*; additionally, information on drainage, soil texture, soil chemical fertility and other morphologic characteristics are retained as *Supplementary Qualifiers*.

The conversion of the legend of the soil map of Belgium to WRB is based on insights gained from classifying more than 540 legacy soil profiles as well as field observations. From these insights heuristic rules were deduced for correlating soil types to *Reference Soil Groups*. The database AARDEWERK-93 and the AARDEWERK-STAT were used to further assess the chemical soil fertility status (*Dystric*, *Eutric*, *Salic* or *Calcaric*) for each *soil type* and according to the various soil districts. Wherever ambiguities were encountered for further correlating the soil types to WRB units, the central concept of each soil type, as described in the explanatory text was taken as reference.

The conversion of the legend of the soil map of Belgium to WRB results into a regrouping of the *soil types* into broader WRB soil units. These *Soil Units*, defined as *Reference Soil Groups* with *Qualifiers*, can neatly be represented on 1 : 40 000 scale maps. This

conversion served as a basis for further generalising the soil map, which can be presented at a 1 : 250 000 scale. The mapping units of this map contains information on the dominant *Soil Unit* (i.e. the most common); and two associated *Soil Units* (second and third most common).

Converting the legend of the soil map of Belgium into WRB does not imply substituting one classification system with another one. Map users who would need detailed information, can still refer to the information as provided by the soil type on the original soil map. Rather than seeing the present exercise as a conversion of legends, the original *soil types* have been reorganised in higher ranked classification categories determined by the *Reference Soil Groups* and *qualifiers*, and overall shedding new insights into the soil geography of the Flemish region.

Samenvatting

De legende van de gedetailleerde bodemkaarten (schaal 1: 20 000) van het Vlaamse Gewest is omgezet naar de 3de editie van het internationaal bodemclassificatiesysteem *World Reference Base for Soil Resources* (WRB). Het WRB bodemclassificatiesysteem is de standaard om bodemgegevens te harmoniseren binnen Europa. Het doel van de huidige opdracht was de systematische omzetting van alle gedetailleerde bodemkaarten, inclusief de bodemkaarten van de kuststreek, zodat deze kunnen voorgesteld worden op een schaal van 1 : 20 000 tot 1 : 50 000. Deze kaarten dienden voor een verdere generalisatie naar een schaal 1 : 250 000 door te voeren.

De legende van de bodemkaart van België is gebaseerd op drie hoofdkenmerken: bodem textuur, drainage status en de ontwikkeling van het bodemprofiel. De WRB classificatie is gebaseerd op diagnostische kenmerken gedefinieerd door morfologische, fysische en chemische bodemeigenschappen. Voor het Vlaamse Gewest zijn er meer dan 4000 bodemtypes (die overeenkomen met kaarteenheden). Om regionale variabiliteit in rekening te brengen, is de indeling van deze bodemtypes gedaan voor 24 bodemdistricten. Bij de omzetting naar WRB werden voor het Vlaamse gewest, 16 *Reference Soil Groups* herkend. Specifieke kenmerken van deze *Reference Soil Groups* werden aangegeven met niet meer dan drie *Principal Qualifiers*; verdere informatie over drainage toestand, bodemtextuur, bodem chemische vruchtbaarheid en bodem-morfologische kenmerken worden weergegeven als *Supplementary Qualifiers*.

De omzetting van de legende van de bodemkaart van België naar WRB is gebaseerd op inzichten uit de classificatie van meer dan 540 historische bodemprofielen en van bijkomende veldwaarnemingen. Vanuit deze inzichten werden heuristische regels afgeleid voor het correleren van de bodemtypen met *Reference Soil Groups*. De databases AARDEWERK-93 en de AARDEWERK-STAT werden gebruikt om de chemische bodemvruchtbaarheid in te schatten (*Dystric*, *Eutric*, *Salic* of *Calcaric*) voor elk bodemtype en er bodemdistrict. Wanneer de omzetting niet meteen duidelijk was, bij gebrek aan gegevens, werd het centrale concept behorend tot het bodemtype beschreven in de begeleidende nota's van de originele kaartbladen als richtlijn genomen.

De omzetting van de legende van de bodemkaart van België naar WRB leidt tot een hergroepering van de bodemtypes in bredere WRB classificatie eenheden. Deze *Soil Units*, gedefinieerd als *Reference Soil Groups* met hun *Qualifiers*, kunnen worden weergegeven op kaarten op een 1: 40 000 schaal. Deze omzetting werd verder gebruikt om een veralgemeende kaart te maken die kan weergegeven worden op een schaal 1 : 250 000. De kaarteenheden van deze kaart bevat informatie over de dominante *Soil Units* (d.w.z. de meest voorkomende *Soil Unit*), en de tweede en derde meest voorkomende *Soil Units* (geassocieerde bodems).

Het omzetten van de legende van de bodemkaart van België in WRB komt niet neer op het vervangen van een classificatiesysteem met een andere. Kaartgebruikers die de gedetailleerde informatie van de oorspronkelijke kaarten nodig hebben, kunnen deze nog steeds gebruiken maar de Belgische bodemtypes passen nu in ruimer classificatiesysteem bestaande uit de WRB *Reference Soil Groups* met hun *Qualifiers*.

1. Background and objectives

Within the European Union there is a general interest to prepare joint soil maps at a 1 : 250 000 scale in order to harmonize agricultural and environmental policies. The World Reference Base for Soil Resources which is the international soil classification system endorsed by the International Union of Soil Sciences, has been adopted as the common classification system for Europe. As soil surveys in most European countries were conducted independently, the challenge is now to convert the national legends into a common WRB legend. The authorities of both the Flemish and the Walloon regions therefore commissioned studies to elaborate a methodology for converting the legend of the soil map of Belgium to the World Reference Base for Soil Resources (WRB) (Bouhon and Dondeyne, 2011; Dondeyne *et al*. 2012). These studies have shown that though some general rules could be established for converting mapping units from the soil map of Belgium to WRB, local particularities needed to be taken into account.

In general the WRB *Reference Soil Groups* combined with one, two or three *Principal Qualifiers*, allow to represent the salient soil information of the original soil maps. As the class definitions of WRB are broader than the ones of the Belgian classes, original mapping units can be generalized and adequately be presented on maps at a 1 : 50 000 scale. These maps have the advantage to provide the soil information in an internationally accepted legend. The combination of *Reference Soil Groups* with *Principal Qualifiers* also proved to be a good basis for further generalizing to derive maps at a 1 : 250 000 scale.

In this text, technical terms or names specific to WRB have been written in italics, e.g. *Reference Soil Groups*, *Eutric Cambisols*; terms or designations of soil types specific to the legend of the soil map of Belgium, or specific to the Flemish region, have been used in bold, e.g. textural classes **A..**, soil types as **Aba1**, **u-Ldp,** or names of soil districts **Maasvlakte, Krijtland**, …

2. The soil map of Belgium

2.1 The soil survey project

The systematic soil survey of Belgium started within the framework of the Committee for the Establishment of the Soil and Vegetation Map of Belgium in 1947. The soil survey was initiated just after World War II, out of an urgent concern for increasing agricultural production (Dudal *et al*., 2001). The basic aim of this committee, sponsored by the then Institute for Encouraging Scientific Research in Industry and Agriculture[1] (IWONL/IRSIA) was to identify, classify and map the soils of Belgium. The greatest part of this work has been carried out between 1947 and 1974 by the Soil Survey Centre (CVB/CCS) in Ghent under the direction of Prof. R. Tavernier. This centre did the overall coordination, supervision and operated in close cooperation with the Faculties of Agriculture of Gembloux, Gent and Leuven. In 1975 the Soil Survey Centre of southern Belgium (Gembloux) was charged to complete the soil survey in the southern parts of Belgium.

During the fieldwork, the surveyors were using copies of the cadastral maps at a 1 : 5000 scale to locate their field observations and to draft mapping units. These units were then transferred on a topographic base map at a 1 : 10 000 scale and finally reduced and published at a 1 : 20 000 scale, as illustrated in Fig. 2.1.

The published map sheets covered at most an area of 80 km² each (8 × 10 km²), and were digitized in the 1990s. For the Flemish region, the digital version can be consulted through internet applications at https://dov.vlaanderen.be/dovweb/html/bodemloketten.html#bodemkaarten and scanned versions of the original soil maps, together with the explanatory booklets, can also be downloaded from this site. Printed versions of the maps, together with their accompanying explanatory notes, can still be purchased at the Laboratory of Soil Science, Ghent

[1] In the 1990s the IWONL/IRSIA was reorganised in the *Vlaams Instituut voor de Bevordering van het Wetenschappelijk-technologsch Onderzoek in de Industrie* (IWT) for the Flemish community, and in the *Fonds pour la formation à la Recherche dans l'Industrie et dans l'Agriculture* (FRIA) for the Francophone community

University, for maps of the northern part of the country, and at the Gembloux Agro-Bio Tech campus of the University of Liège, for the southern part of the country. For the Walloon region, the digital version of the maps can be consulted at http://cartopro3.wallonie.be/CIGALE/viewer.htm.

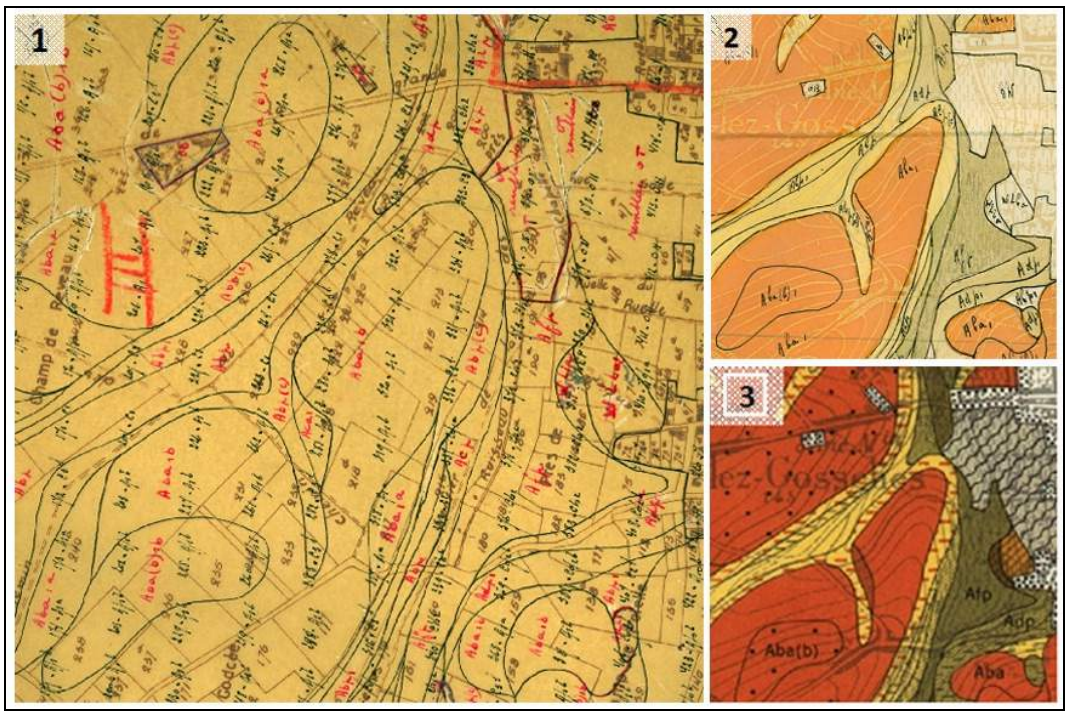

Figure 2.1 - Illustration of the soil mapping processes: (1) soil units and observations were drafted on copies of the cadastral plan (scale 1 : 5000); (2) mapping units were transposed to topographic base maps (scale 1 : 10 000); and (3) maps were published in colour and at a 1 : 20 000 scale (adapted from Legrain et al., 2012 - scales not respected)

Field observations by soil augers were made with a density ranging from 1 to 2.5 per hectare done to a standard depth of 125 cm unless impenetrable layers or rocks were encountered. Besides, over the whole territory, about 15 000 soil profiles have been described and analysed, the data of which have been entered into the soil database AARDEWERK (Van Orshoven *et al.*, 1988; 1993). The database AARDEWERK has recently been revised and complemented for the Flemish region which resulted in the new AARDEWERK-Vlaanderen-2010 database (Beckers *et al.*, 2011). AARDEWERK-Vlaanderen-2010 has recently be complemented with a statistical application allowing to

determine average values (median and their ranges) as AARDEWERK-STAT (Beckers *et al*., 2012). These data are also available at https://dov.vlaanderen.be/dovweb/html/index.html.

2.2 Legend of the soil map of Belgium

The inland parts

The general legend of the soil map of Belgium[2], and the corresponding soil classification system, is based on morphogenetic properties readily identifiable in the field. The principal properties are soil texture, drainage status and profile development. **Soil series** are defined as a combination of class definitions of these properties, as explained below. **Soil variants** are recognized based on (i) the occurrence of lithologic discontinuities (substratum), (ii) admixtures of parent materials (e.g. limestone in a soil otherwise derived from loess), (iii) variations in the profile development (e.g. strongly mottling in and above an *Argic* horizon, or the occurrence of a *Fragic* horizon). **Soil phases** are recognized according to the depth or thickness of particular characteristics, for example whether the *Argic* horizon is immediately under the plough layer or not.

The soil textural classes, is the first property considered for defining **soil series** and these are defined according to Fig. 2.2.a. The class definitions are based on the relative content of clay, silt and sand. These classes differ from e.g. the international used USDA or FAO classes. As a consequence, the Belgian class for "heavy clay" (symbol "**U**") is much wider than what is defined as *heavy clay* in the FAO soil textural classes (Fig. 2.2.b).

The Belgian classes also differ from the international definition as the silt fraction is defined by particle size ranging from 2 to 50 µm instead of 2 to 63 µm in the FAO textural classes and which are also used in WRB[3]. Beside these 7 textural classes, additional symbols are used for special cases. For example, when there is more than 5% (by volume)

[2] For more details on the legend see Maréchal and Tavernier (1974), Van Ranst and Sys (2000), and Bah *et al*. (2005).

[3] The FAO textural classes use the same names and define classes on the same ratio of percentage clay, silt and sand as the USDA textural classes, but the latter also has silt defined as particles with size range of 2-50 µm.

of gravel or stones the symbol **G** is used; the symbol **V** is used for peat soils saturated predominantly by groundwater, and **W** when they are predominantly saturated by rainwater.

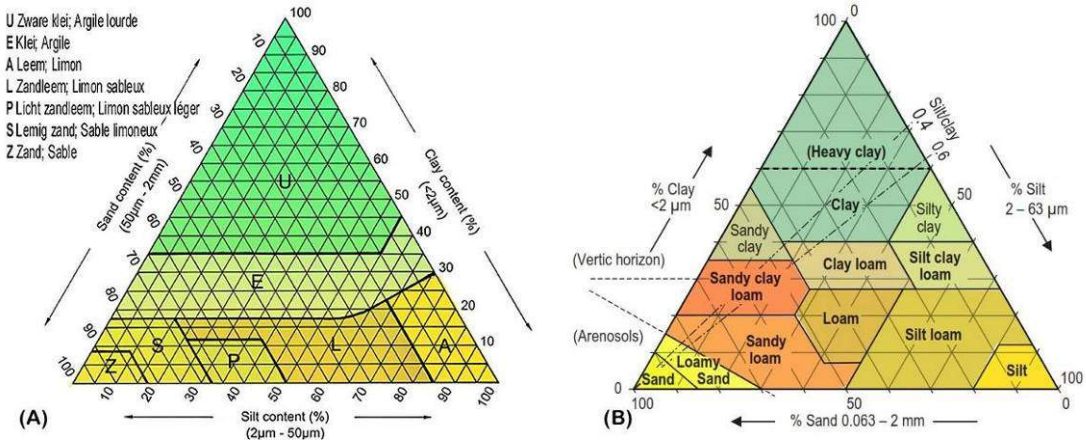

Figure 2.2 – Textural classes according to (A) Belgian textural classes (adapted from Van Ranst and Sys, 2000); and (B) FAO textural classes (adapted from FAO, 2006). In the Belgian classification system, the symbol for the textural classes are used as the first symbol in the code determining the soil series

The drainage status is the second property by which a **soil series** is defined. Drainage classes are defined according to depth at which redoximorphic mottling and/or reduction colours occur. A differentiation in critical depth is made between the silty and clayey textures and the sandy textures (Table 2.1).

Table 2.1 - Definitions of drainage classes according to the legend of the soil map of Belgium

Symbol	Definition	Depth of occurrence (cm)			
		Silty & Clayey (A, L, E, U)		Sandy (Z, S, P)	
		Redoxmorphic mottling	Reduction colours	Redoxmorphic mottling	Reduction colours
No groundwater within 125 cm of soil surface					
.a.	excessively drained	-	-	>120	-
.b.	well drained	-	-	90-120	-
.c.	moderately well drained	>80	-	60-90	-
.d.	imperfectly drained	50-80	-	40-60	-
.h.	poorly drained	20-50	-	20-40	-
.i.	very poorly drained	0-20	-	-	-
Groundwater present within 125 cm of soil surface					
.e.	poorly drained	20-50	>80	20-40	>100
.f.	very poorly drained	0-20	40-80	0-20	50-100
.g.	extremely poorly drained	0	<40	0	<50

(adapted from: Van Ranst and Sys, 2000; p. 15)

The soil profile development is taken as a third property (and symbol), defining the **core soil series**. Their definition and the corresponding symbols are presented in Table 2.2, as well as, where applicable, the equivalent diagnostic horizons according to WRB.
Variants and **phases** of these **core soil series** are defined by three properties that can be indicated by additional symbols depending on the complexity of the profile.

Table 2.2 - Class definitions of soil profile development and corresponding diagnostic horizons according to WRB-2007

Symbol	Definition	Diagnostic horizon or properties
..a	soils with a textural B horizon	Argic horizon
..b	soils with a structure or colour B horizon	Cambic horizon, Brunic qualifier
..c	soils with strongly mottled or broken texture B horizon	Argic horizon with retic properties, Fragic horizon
..d	soils with yellow-red texture B horizon	(*does not occur in the Flemish region, only in the Walloon region*)
..**e**	soils with a thick dark A horizon and calcaric subsoil	Mollic horizon
..**f**	soils with a poorly expressed iron and/or humus B horizon	Cambic horizon, or Brunic qualifier
..g	soils with a well developed iron and/or humus B horizon	Spodic horizon
..h	Soils with a broken iron and/or humus B horizon; often under thick anthropogenic layers	Terric horizon, with Relocati-spodic horizons
..m	Soils with a thick anthropic humus A horizon	Plaggic horizon, Terric horizon
..p	Soils “without a profile development”; though mostly with a structure or colour B horizon when in colluvial or alluvial deposits	Cambic horizon (in most cases), or Brunic qualifier, or Fluvisols, or Regosols
..x	Soils with undifferentiated profile development; mostly in Tertiairy marine deposits	Cambic horizon, Argic horizon

(adapted from Maréchal and Tavernier, 1974)

With some training and experience, all of these characteristics can readily be identified in the field, particularly as the definition of “soil profile development” did not require any physico-chemical analysis. Still very often the soil surveyors checked for the presence of $CaCO_3$ using concentrated HCl, and whereby no reaction was taken as an indication of the presence of Bt horizon. Soil surveyors could hence directly indicate the classification in the field, be it while augering or when describing a soil profile pit.

To illustrate the classification system, consider for example the "core soil series" **Zbg**; the first capital means the soil texture is sand (**Z**); the second symbol means the drainage status is well drained (**.b.**); and the third symbol (**..g**) indicates that the soil profile development corresponds to a "*Spodic* horizon". Such well drained *Podzols* have in most cases a clearly bleached horizon, which qualifies as an *Albic* horizon, and in WRB would hence be classified as an *Albic Podzol.* An example of such a soil profile is shown in Fig. 2.3.

Figure 2.3 – Albic Podzol in a landscape of sand dunes in the Campine region (northern part of Flemish region, map sheets Turnhout - Arendonk); this landscape unit is actually mapped as "ZAg" being a complex of the soil series Zag, Zbg, Zcg and Zdg and this mapping unit has typically been used for sand dunes, as apparent from the shaded terrain image.

Legend of the polders

The legend used for the coastal plain is based on geomorphologic characteristics, rather than on strict soil properties; the mapping units however are also all defined in terms of soil properties whereby mostly the soil texture, variations in sediment deposits, and variations in organic matter content, including peat, are taken into account.

The coastal plain can be divided into coastal sand dunes, polders and fringes of the polders, the latter are part of the polders with marine deposits shallowly overlying quaternary cover sands (**Dekzanden, series P**) or tertiary deposits (**series T**).

The major geomorphic units, based on the legend of the soil map, are presented in Fig. 2.4. The dunes are subdivided into high dunes (**series A**), lower dunes (**series B**), and levelled dune soils (**series C**) and dune fringes (**series D**). At the time of the soil survey the polders have been subdivided according to their presumed relative age - based on the then accepted hypotheses of different sea transgression and regressions - and which can be summarized as:

- Old land polders with deposits, earliest starting from 200-800 AD, but mostly from the 4^{th} – 8^{th} century AD (**Oudland**)
- Mid-land polders, with deposits from the 11^{th} century AD (**Middellandpolders**), and
- Newland polders, with poldering after the 12^{th} -14^{th} century AD (**Nieuwland**) and poldering of the IJzer estuary and Zwin (from 13th – 19th C AD)
- Historical polders of Oostende, with poldering mostly in the 17^{th}-18^{th} century AD polders (**Nieuwland***).*

More recent research has shown that the formation of the polders was a more complex process than implied by this model (Baeteman, 1985; 1999; Baeteman *et al*., 2002).

Within the polders local and/or old depressions, such as sedimentation basins with peat in the subsurface (**Poelgronden** and **Komgronden***),* mudflats (**Oudekleiplaatgronden**, **Schorgronden**), tidal flats (**Waddengronden**), old channels (**Geulgronden**), creek ridges (**Kreekruggen**) which are in-filled tidal channels or sand-filled tidal channels and old back swamps (**Moeren**) are still recognised (see Annex 2 for the relation between soil type and these landscape units). The conversion of soil types to WRB-2007, for each of these detailed landscape units of the coastal plain is given in Annex 4.

The broad geomorphologic units, as implicitly included in the legend of the coastal plain are presented in Fig. 2.4. Besides the above-mentioned units, it can be seen on the map

that large areas have been excavated, be it for clay (**series OG**) or for peat (**series OV**). One mapping unit refers to a particular type of anthropogenic soils, and concerns former habitation areas but with soils rich in organic matter and having high phosphorus content (**series OC**). The tidal muds and tidal flats of the Zwin area in the north-eastern part, is an additional particular unit **series OS**[4].

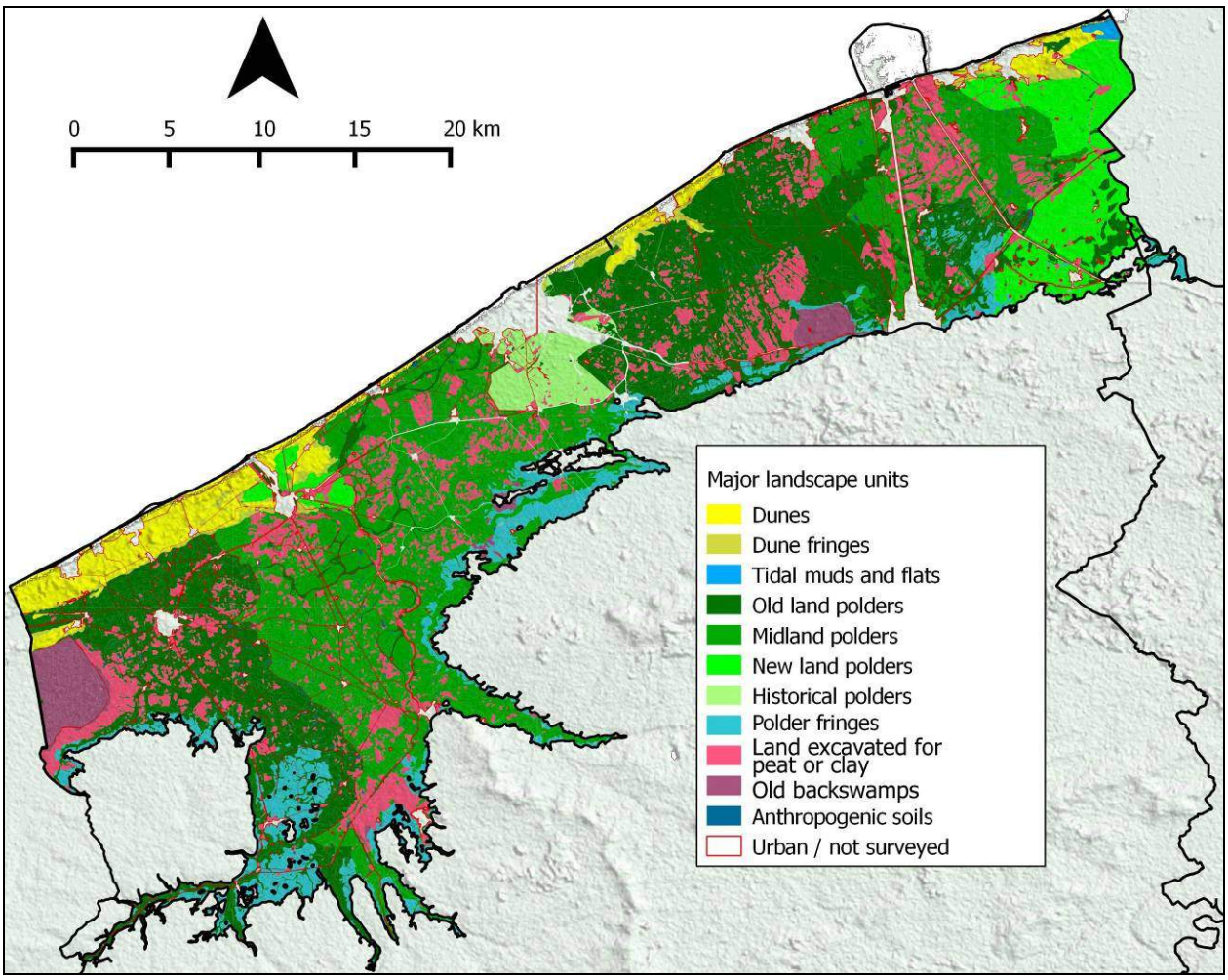

Figure 2.4 – Geomorphologic units of the coastal plains

[4] It seems that this mapping unit was added during the digitalization of the map (as the paper map of this part was never printed), and OS may stand for '**open schor**'.

3. The World Reference Base for Soil Resources[5]

3.1 WRB as a classification system

The World Reference Base for Soil Resources (WRB) was developed drawing on the insights and experiences gained through the elaboration of the FAO-UNESCO legend of the Soil Map of the World (FAO-UNESCO, 1974; FAO, 1988). WRB is in the first place intended to facilitate the exchange of information and experience by providing a common scientific language, and so strengthening applications of soil science and enhancing communication with other disciplines. It was developed and is still being revised by an international working group of soil scientists, coordinated by the International Union of Soil Science. In the period 1998–2006, WRB became the official reference soil nomenclature and soil classification for the European Commission, and has since been widely adopted as tool to harmonize and exchange soil information.

Although WRB draws on the FAO Legend of the Soil Map of the World, it was initially conceived as a two tiers soil classification system rather than a legend. In the 3rd edition of WRB (IUSS Working Group WRB, 2014) the classification system has been adapted so as to accommodate rules for creating map legends. At the first level of classification, 32 *Reference Soil Groups* are distinguished. *Reference Soil Groups* are defined by a set of *diagnostic horizons*, *properties* and *materials*. At a second level, *qualifiers* are added, which serve as "adjectives" to the *Reference Soil Groups*. Two levels of details can be expressed with the qualifiers: firstly, *principal qualifiers* are used to indicate either properties typical for the particular *Reference Soil Group* or properties that show some intergrading with other *Reference Soil Group*s. Secondly, more information on the soil can be provided with the *Supplementary Qualifiers*, which are meant for presenting properties that are not specific to a particular *Reference Soil Group* (e.g. texture, occurrence of lithic discontinuities, colour, humus content, …).

A determination key enables to determine to which *Reference Soil Group* a particular soil belongs. The key requires checking diagnostic features[6], which are defined in terms of

[5] Based on IUSS Working Group WRB (2007, 2010 and 2014).

morphology and physico-chemical analytical properties. The soil belongs to the first *Reference Soil Group* for which all specified requirements are met. The 32 *Reference Soil Groups*, are listed in Table 3.1, according to a simplified key. For the full key and definitions see IUSS Working Group (2014). For the second level of classification, qualifiers are taken from the list of *Principal* and *Supplementary Qualifiers* as indicated in the key, corresponding to the definitions of each of the qualifiers.

Table 3.1 - Rationalized key to the WRB Reference Soil Groups and their occurrence in Belgium

Description	Occurrence in Belgium	
	Confirmed	Not confirmed
A. Organic soils		
1. Soils with thick organic layers	Histosols	
B. Mineral soils		
2. Soils with strong human influence		
Soils with long and intensive agricultural use	Anthrosols	
Soils characterised by human artefacts (>20% volume)	Technosols	
3. Soils with strong limitation to root growth		
Permafrost affected soils		Cryosols
Thin or extremely gravely and stony soils	Leptosols	
High content of exchangeable Na in the subsoil		Solonetz
Alternating wet-dry conditions, rich in swelling clays		Vertisols
High concentration of soluble salts		Solonchaks
4. Soils distinguished by Fe/Al chemistry		
Groundwater-affected soils, underwater soils and soils in tidal areas	Gleysols	
Allophanes or Al-humus complexes		Andosols
Subsoil accumulation of humus and/or oxides	Podzols	
Accumulation and redistribution of Fe		Plinthosols
Low-activity clay, P fixation, many Fe oxides, strongly structured		Nitisols
Dominance of kaolinite and oxides		Ferralsols
Stagnating water, abrupt textural difference	Planosols	
Stagnating water, structural difference and/or moderate textural difference	Stagnosols	
5. Soils with pronounced accumulation of organic matter in the topsoil		
Blackish topsoil, secondary carbonates:		Chernozems
Dark topsoil, secondary carbonates:		Kastanozems
Dark topsoil, no secondary carbonates (unless very deep), high base status:	Phaeozems	
Dark topsoil, low base status:	Umbrisols	

[6] These features may be diagnostic horizons, properties and/or materials

Table 3.1 - Rationalized key to the WRB Reference Soil Groups and their occurrence in Belgium

Description	Occurrence in Belgium	
	Confirmed	Not confirmed
6. Sois with accumulation of moderately soluble salts or non-saline substances		
Accumulation of, and cementation by, secondary silica		Durisols
Accumulation of secondary gypsum		Gypsisols
Accumulation of secondary carbonates		Calcisols
7. Soils with a clay-enriched subsoil		
Retic properties	Retisols	
Low-activity clays, low base status		Acrisols
Low-activity clays, high base status		Lixisols
High-activity clays, low base status	Alisols	
High-activity clays, high base status	Luvisols	
8. Soils with little or no profile differentiation		
Moderately developed soils	Cambisols	
Sandy soils	Arenosols	
Soils with stratified fluviatile, marine or lacustrine sediments	Fluvisols	
Soils with no significant profile development	Regosols	

*(adapted from: IUSS Working Group, 2014 and complemented with own terrain observations and information derived from the soil map of Belgium)

Example

To illustrate how a soil profile is classified in WRB – and how it was classified according to the legend of the soil map of Belgium – the description of soil profile "Meerbeek-01" (province of Vlaams-Brabant) is presented (Fig. 3.1 & Table 3.2) Following the 3rd edition of WRB (IUSS Working Group, 2014) this soil qualifies as an *Eutric Endogleyic Cambisol (Colluvic, Siltic*). The upper 80 cm of this soil consists of colluvium, of which the Bw horizon (35-80 cm) qualifies as a *Cambic* horizon, as it has well developed soil aggregate structures and it has colours distinct from the overlying horizon; colours are one Munsell colour value higher, and also one colour chroma higher. This material is overlying a buried *Luvisol* composed of an E horizon (at 80-100 cm) and an *argic* horizon (100-140 cm). Going through the key to the Reference Soil Groups (IUSS Working Group WRB, 2014; p. 79-110), as the *Cambic* horizon occurs within the first 50 cm, and as no other diagnostic horizon occurs within the first meter, the soil keys out as a *Cambisol*.

Subsequently, the *Principal Qualifiers* are checked in the list from top to down. *Gleyic* is the first relevant qualifier referring to the redoximorphic colour patterns which occur

below 80 cm (in the 2EBg horizon, Fig. 3.1 & Table 3.2). The specifier[7] *Endo-* can be used here to indicate that this feature occurs below 50 cm and within 100 cm, hence *Endogleyic Cambisol*. Assuming that this soil has a base saturation of more than 50%, further down the list the qualifier *Eutric* applies, hence *Eutric Endogleyic Cambisol*.

From the list of *Supplementary Qualifiers* we retain the qualifier *Colluvic* to indicate that the soil consists of colluvium, and the qualifier *Siltic* as it is a fine textured soil. The Supplementary Qualifiers are given in alphabetical order, so the full name of the soil is *Eutric Endogleyic Cambisol (Colluvic, Siltic).*

To indicate that this colluvial soil is actually overlying a buried *Luvisol,* the soil can be named as *Eutric Endogleyic Cambisol (Colluvic, Siltic)* over *Gleyic Luvisol (Cutanic, Siltic).* The buried soil indeed keys out as a *Luvisol* as it has an *argic* horizon (*2Btg* in Fig. 3.1 & Table 3.2) and a base saturation of more than 50%, with the *Supplementary Qualifier Cutanic* referring to presence of clay coatings in the 2Btg horizon (Fig. 3.1 & Table 3.2).

On the original soil map, the site is mapped as an **Adp** soil type. The first symbol **A**.. refers to the "*Silt* or *Silt Loam*" texture; the second symbol **.d.** to its imperfect drainage; and the third **..p** would in principle refer to soils "without any soils profile development" (see Table 2.2). However, as this soil has a clearly developed *Cambic* horizon, the practical meaning of symbol **..p** is that the soil consists mostly of colluvial deposits of Holocene age. The Holocene age of this colluvium was attested by the presence of the remants of a Roman tile at the base of the *Bw* horizon (Van de Konijnenburg *et al*., 2013).

[7] IUSS Working Group WRB, 2014; p. 13-15 for full definitions

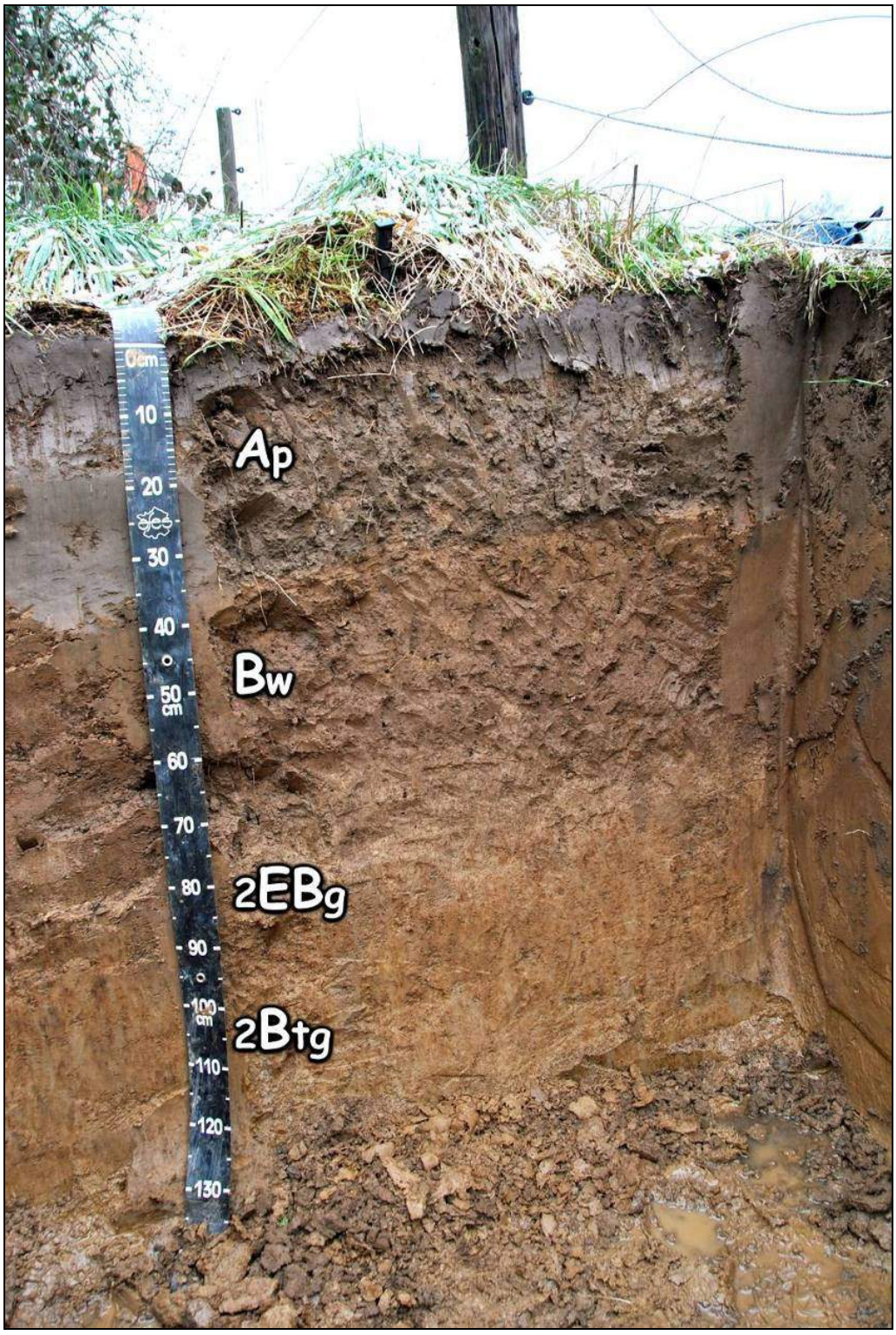

Figure 3.1 – Soil profile pit "Meerbeek-01", is a Eutric Endogleyic Cambisol (Colluvic, Siltic), and mapped as soil type Adp (sheet Erps-Kwerps 89W); below 80 cm a buried profile occurs which is "Gleyic Luvisol (Cutanic, Siltic)

Table 3.2 – Description and diagnostic features of soil profile "Meerbeek-01" illustrating the WRB as a classification system; all colours are moist colours

Horizon	Depth (cm)	Description	Diagnostic features
Ap	0-35	Silt Loam in USDA classes (**A** in Belgian textural classes); dark brown 10YR 3/3 (moist); moderate strong, medium angular to sub-angular blocky structure; slightly sticky, plastic and friable moist; many fine and medium roots; few to common tubular and interstitial pores and many earthworm galleries; small pieces of bricks (<5 cm) and charcoal, boundary smooth and abrupt	Ochric horizon, colluvic material, Eutric
Bw	35-80	Silt Loam in USDA classes (**A** in Belgian textural classes); Brown 10YR 4/4 (moist); moderate to strong medium angular block structure; slightly sticky, plastic and friable moist; many fine roots; common tubular and interstitial pores and many earthworm galleries; piece of roman tile (5-10 cm), boundary smooth to wavy and clear	Cambic horizon, colluvic material, Eutric
2EBg	80-100	Silt Loam in USDA classes (**A** in Belgian textural classes); dull yellowish brown 10YR 5/3 (moist); common medium distinct brown mottles (10YR 4/6) and Mn-Fe speckles (5 mm); strong medium angular blocky structure; few very fine clay coatings on pores and pedfaces; slightly sticky, plastic and friable moist; many fine roots; many tubular and interstitial pores, few earthworm galleries; boundary wavy and gradual	Gleyic properties in a clay eluviated horizon, Eutric
2Btg	100-140+	Silt Loam in USDA classes (**A** in Belgian textural classes); strongly mottled brown 10YR 4/6 to dull yellowish brown 10YR5/3 (moist); and Mn-Fe speckles (> 5 mm); strong medium angular blocky structure; fine, continuous clay coatings on pores and pedfaces; slightly sticky, plastic and friable moist; many fine roots; many tubular and interstitial pores	Argic horizon, Gleyic properties, Eutric

3.2 WRB for constructing map legends

Being limited to only two levels of classification, WRB allows for classifying a wide range of soil properties in a flexible manner, as illustrated by the above example. However, when generalization is required, as is done when legends of soil maps are constructed, a choice has to be made on which qualifiers to retain. The guidelines for constructing map legends have been included in the 3rd edition of WRB, so that legends would internationally be made in a consistent way.

The rules for creating map legends are summarized here (IUSS WRB Working Group, 2010; p. 11-13):

A mapping unit consists of

- a dominant soil unit[8] only, or
- a dominant soil unit plus a co-dominant soil unit and/or one or more associated soil units, or
- two or three codominant soil units or
- two or three codominant soils plus one or more associated soil units.

Dominant soil units represent ≥ 50% of the soil cover, codominant soil units ≥ 25 and < 50% of the soil cover. Associated soil units represent ≥ 5 and < 25% of the soil cover, or are of high relevance in the landscape ecology.

The maximum number of qualifiers depends on the intended map scale and whereby for the codominant or associated soil units fewer *qualifiers* (or even no *qualifier*) may be provided:

- For very small map scales (e.g. smaller than 1:10 000 000), only the *Reference Soil Group* (RSG) is used
- For larger map scales (e.g. from 1:5 000 000 to 1:10 000 000), the RSG plus the first applicable *principal qualifier* are used.
- For next larger map scales (e.g. from 1 : 1 000 000 to 1 : 5 000 000), the RSG plus the first two *principal qualifiers* are used.
- For next larger map scales (e.g. from 1 : 250 000 to 1 : 1 000 000), the RSG plus the first three applicable *principal qualifiers* are used.
- If there are fewer *qualifiers* applicable than described above, the lesser number is used.

Futhermore, depending on the purpose of the map or according to national traditions, at any scale level, further *qualifiers* may be added optionally. They may be additional *principal qualifiers* from further down the list and not already used in the soil name, or they may be *supplementary qualifiers*.

[8] The term *soil unit* is not explicitly defined in the 3rd edition of WRB; we use it to refer to the second classification level – i.e. RSG with qualifiers – similarly as was done for the FAO legend of the Soil Map of the World.

For constructing a map legend, and given the limitation of the legacy soil survey data, we have opted to correlate the **soil types** of the Flemish region to *Reference Soil Groups*, combined with a maximum of three *principal qualifiers.* The *principal qualifiers* are organised following the rules of WRB, and are stored into three separate fields in the GIS layer.

Additionally, for facilitating the use of the soil map in a GIS environment, we added four *supplementary qualifiers* grouped according to thematic properties. These are:

- drainage status: *Endogleyic*, *Amphigleyic*, *Stagnic*, …
- texture classes: *Siltic*, *Loamic*, *Arenic*, *Clayic*
- chemical fertility: *Dystric*, *Eutric*, *Calcaric*, *Salic*
- morphologic features: *Colluvic*, *Fluvic*, *Relocatic*, *Ruptic*, *Abruptic, Thapto-histic*, …

The *supplementary qualifiers* have been organised on the consideration that some GIS users may be less familiar with WRB as a classification system. Therefore all records have been explicitly recorded even when this may result to redundant information; e.g. "*Eutric*" for *Phaeozems* and *Luvisols*, "*Arenic*" even for *Arenosols*, etc.

The advantage of having e.g. a separate *qualifier* for drainage is that a GIS user can check this property for every *Reference Soil Group.* The qualifier *Gleyic*, or *Stagnic*, for example, are not amongst the *Principal Qualifiers* for the *Anthrosols* while it is for most other *Reference Soil Groups;* furthermore these qualifiers are implicit to *Stagnosols*, *Planosols* and *Gleysols*.

3.3 Characteristics of the Reference Soil groups of the Flemish region

In Table 3 the *Reference Soil Groups* which are known to occur in Belgium have been presented along with a simplified key. Following the sequence of the key, we present the major characteristics of the *Reference Soil Groups* which occur in the Flemish region (adapted from IUSS Working Group WRB, 2014). Their distribution is illustrated with

simplified maps derived from the detailed digital soil map. Standard definitions of WRB terms are presented in Annex 1.

Histosols

Histosols (Fig. 3.2) are dark soils with high accumulation of partially decomposed organic matter generally developed in wet or cold conditions (from the Greek, *histos*, meaning tissue). Production rates of organic matter exceed decomposition rates with accumulation of organic matter as a result. Low temperatures and/or limited oxygen conditions retard decomposition. In the Flemish region they can be found in the lowlands, fed by groundwater (*Rheic Histosols*). These soils were particular common in the valleys in the Campine area, but have often been drained and "reclaimed" in the framework of large land reallotment projects during the late 1950s and 1960s. *Histosols* are also common as buried soils in the coastal polders (Fig. 3.2b).

Figure 3.2 – (a) Landscape with Rheic Histosols, soil type* V*, in the nature conservation area "de Zegge" province of Antwerp; (b) buried Histosol in the coastal polders, a Fluvic Gleyic Cambisol (Thaptohistic) soil type OV2, in Dudzele (province of West-Vlaanderen)

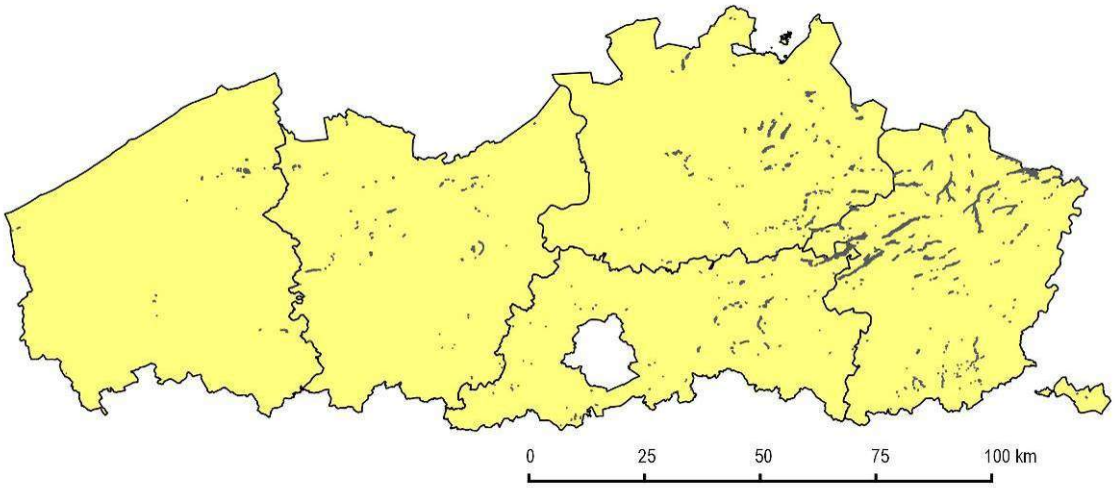

Figure 3.3 - Distribution of Histosols in the Flemish region

Anthrosols

Anthrosols (Fig. 3.4) are formed (or modified) by human activity that caused profound changes in soil properties (from the Greek *anthropos*, meaning man). They are found in areas of long term cultivation where substantial additions of mineral and organic fertilizers or continuous application of earth as e.g. sods or shells took place. *Anthrosols* are found in areas where people have practised agriculture for a long time (Fig. 3.5). Depending on the origin of the added material and on the farming system, *Anthrosols* in the rural areas of the Flemish region are either *Plaggic Anthrosols* with BS < 50%, and/or pH-H_2O < 5.5; or *Terric Anthrosols* with BS > 50%, and/or pH-H_2O > 5.5.

Plaggic Anthrosols are formed where heather sods were used for bedding livestock, where afterwards the mixture of sods and excrements was spread on the fields to raise the fertility of the soil. They have a surface horizon with a high amount of organic matter, at least 50 cm thick. These soils are located in the Campine Region in the eastern part of Flanders.

Terric Antrosols develop through addition of materials rich in earthly manures, compost, loess or mud at least 50 cm thick. In the soil district “Westelijke Boomse cuesta” around the town of Sint-Niklaas, they occur as typical raised fields (“Bolle akkers”).

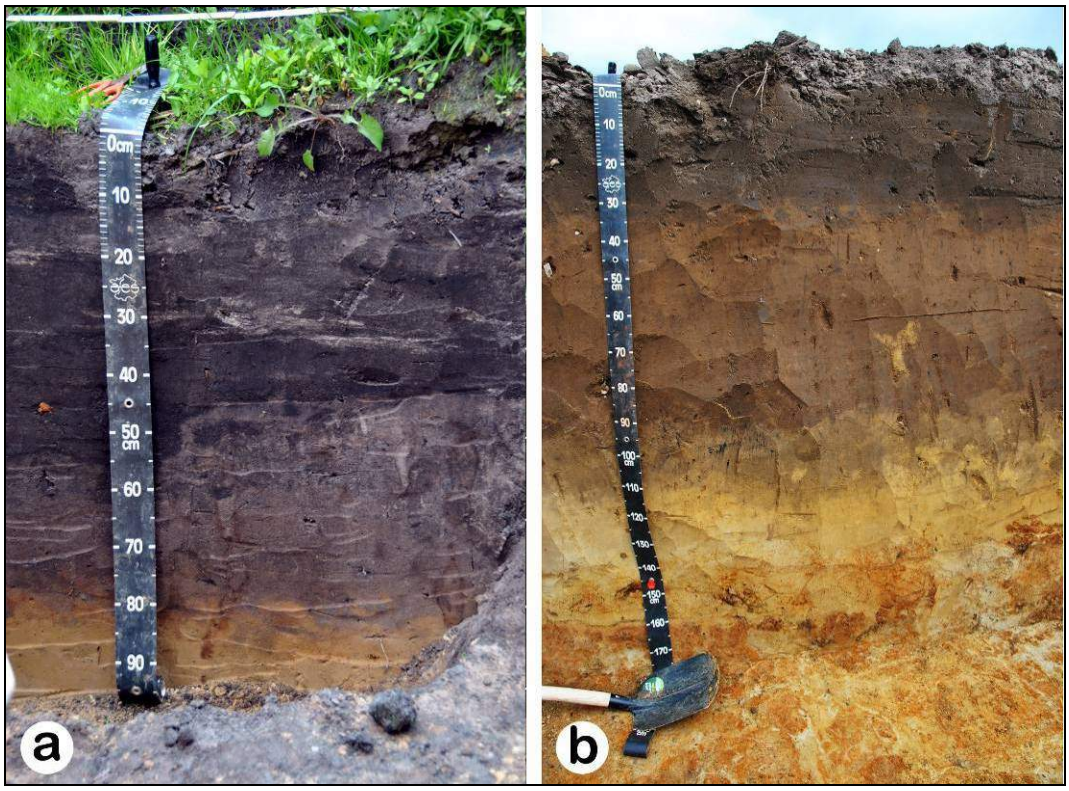

Figure 3.4 - (a) Plaggic Anthrosol, soil type Scm, in Oud-Turnhout (province of Antwerp); (b) Terric Anthrosol, soil type Sdm, in Bree (province of Limburg)

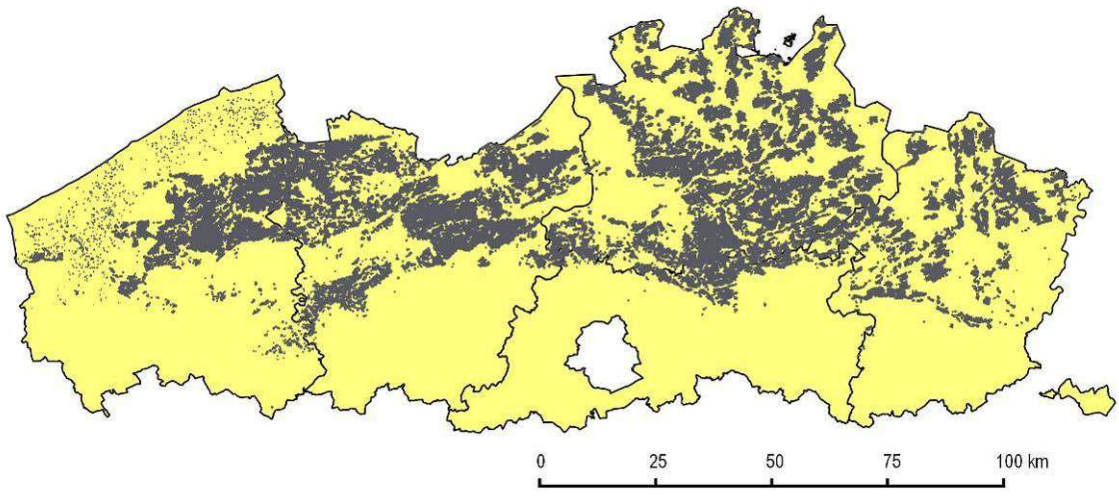

Figure 3.5 - Distribution of Anthrosols in the Flemish region

Technosols

Technosols (Fig. 3.6) are soils strongly influenced by human-made material (from Greek *technikos*, meaning skilfully made). Technosols contain a significant amount of artefacts (something in the soil recognizably made or strongly altered by humans or extracted from

greater depths) or are sealed by technic hard material (hard material created by humans, having properties unlike natural rock) or contain a geomembrane. They include soils from wastes (landfills, sludge, cinders, mine spoils and ashes), pavements with their underlying unconsolidated materials, soils with geomembranes and constructed soils. They occur mostly in urban and industrial area. Soils in these areas were not surveyed; the mapping unit are hence indicated as "Technosols/not surveyed" areas (Fig. 3.7), and actually also include restricted areas such as military zones.

Figure 3.6 - Garbic Technosol, soil type ON around Turnhout (province of Antwerp)

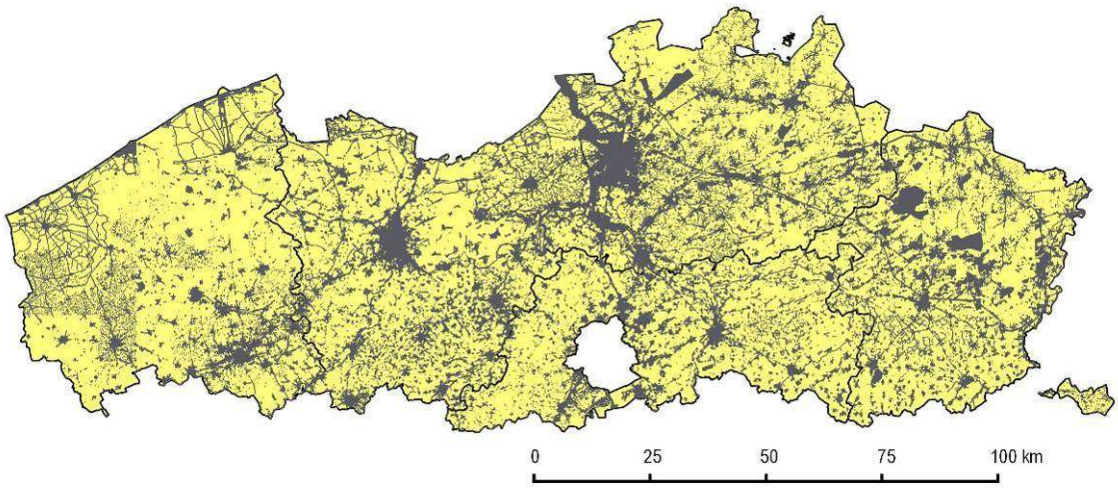

Figure 3.7 - Technosols, urban areas and not surveyed areas of the Flemish region

Leptosols

Leptosols are shallow soils over hard rock or gravelly material (from the Greek, *leptos*, meaning thin). They are common in rocky and mountainous areas where the soil has been partially eroded. In the Flemish area they occur only locally as rock outcrops, of sandy ironstone from Tertiary marine deposits; but the area is too small for retaining on the soil map.

Gleysols

Gleysols (Fig. 3.8) are soils saturated by groundwater near the surface for long periods (from the Russian, *gley*, meaning 'mucky mass'). A gleyic colour pattern develops with reddish, brownish or yellowish colours on ped surfaces in the upper soil layers and greyish, bluish colours inside the peds or in deeper soil layers. *Gleysols* occur mainly in lowland areas where the groundwater comes close to the surface and the soil is saturated with groundwater for long periods of time (Fig. 3.9).

Figure 3.8 - Reductigleyic Gleysol, soil type Lgp, in Kuurne (province of West-Vlaanderen)

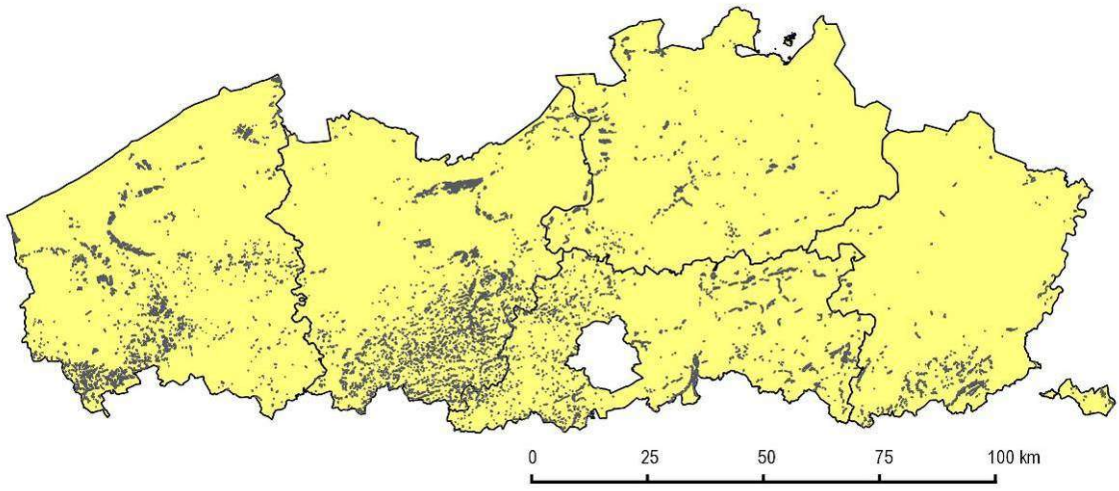

Figure 3.9 - Distribution of Gleysols in the Flemish region

Podzols

Podzols (Fig. 3.10) are acidic, mostly coarse textured soils with a bleached horizon underlain by an accumulation of organic matter, aluminium and iron (from the Russian, *pod*, meaning under, and *zola*, meaning ash, and which refers to the greyish colour of the *Albic* horizon). Migration of aluminium, iron and organic compounds took place from the

surface to the B-horizon with percolating rainwater under acidic conditions. A strongly bleached *Albic material* is left behind with a dark spodic horizon containing humus complexes deposits underneath. They can be found commonly under vegetation with acidic litter (Fig. 3.11). A low level of nutrients, low pH and limited available moisture make them unattractive for agriculture. Very often these soils have been perturbated, by ploughing when used for agriculture, but also by forested who riped the thin iron pan as illustrated in Fig. 3.10b.

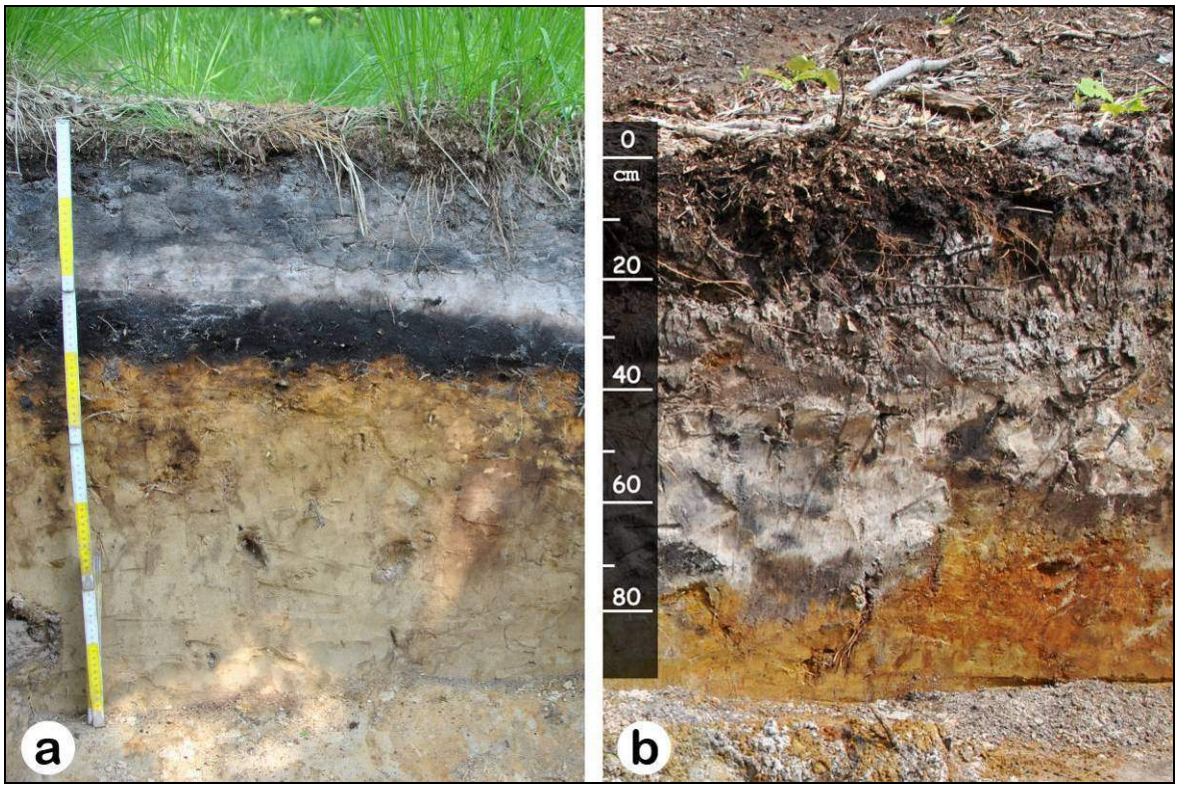

Figure 3.10 – (a) Albic Podzol, soil type Zbg, in Oud-Turnhout (province of Antwerp); (b) Albic Podzol, (Relocatic), soil type Zcg, in Herentals (province of Antwerp); here the upper parts of the Spodic horizon have been perturbed as foresters ripped the iron pan of the Podzol

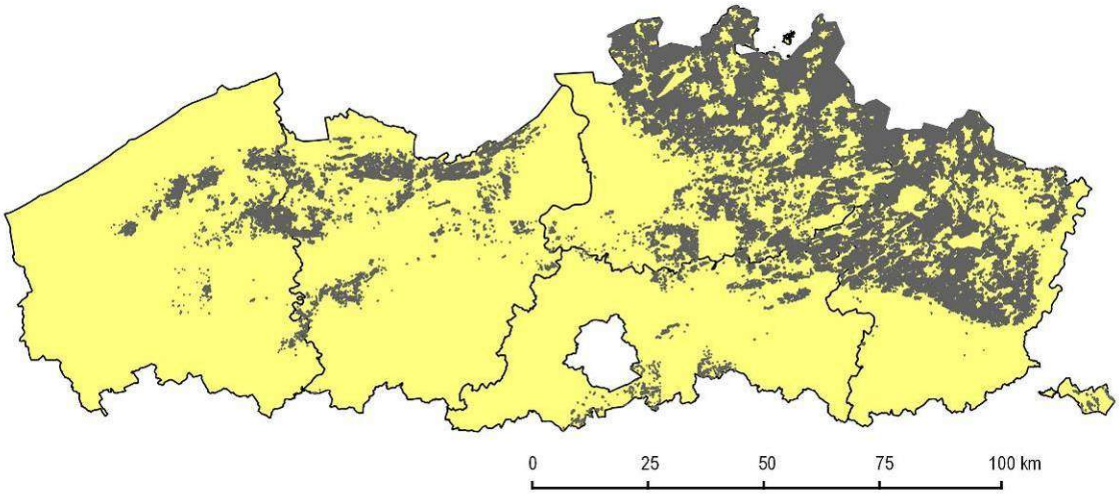

Figure 3.11 - Distribution of Podzols in the Flemish region

Planosols

Planosols (Fig. 3.12) have coarse-textured surface horizons abruptly over dense and finer textured subsoil. They are typically in seasonally waterlogged flat lands (from Latin, *planus*, meaning flat). The soil profile shows sign of water stagnation, as redoximorphic mottling above the *abrupt textural change*. In the Flemish regions these soils are common where loamy or silty Eolian deposits occur above Tertiary marine clay deposits (Fig. 3.13).

Figure 3.12 - Retic Planosol, soil type u-Pdc, in Roeselare (province of West-Vlaanderen)

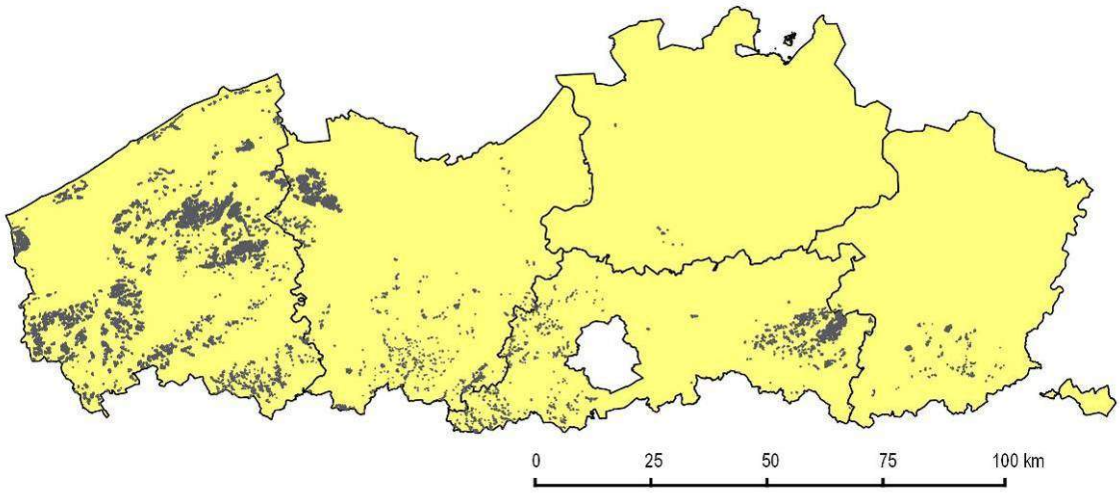

Figure 3.13 - Distribution of Planosols in the Flemish region

Stagnosols

Stagnosols (Fig. 3.14), just as *Planosols*, are soils with perched watertable (from Latin, *stagnare*, to flood), but do not have the *abrupt textural change.* They show periodically

reducing conditions resulting in *stagnic* properties. Infiltration of water is usually limited by a shallow, impermeable layer. *Stagnosols* can be found in flat or gently sloping land (Fig. 3.15).

Figure 3.14 - Endogleyic Stagnosol, soil type Phc¸ in Meulebeke (province of West-Vlaanderen)

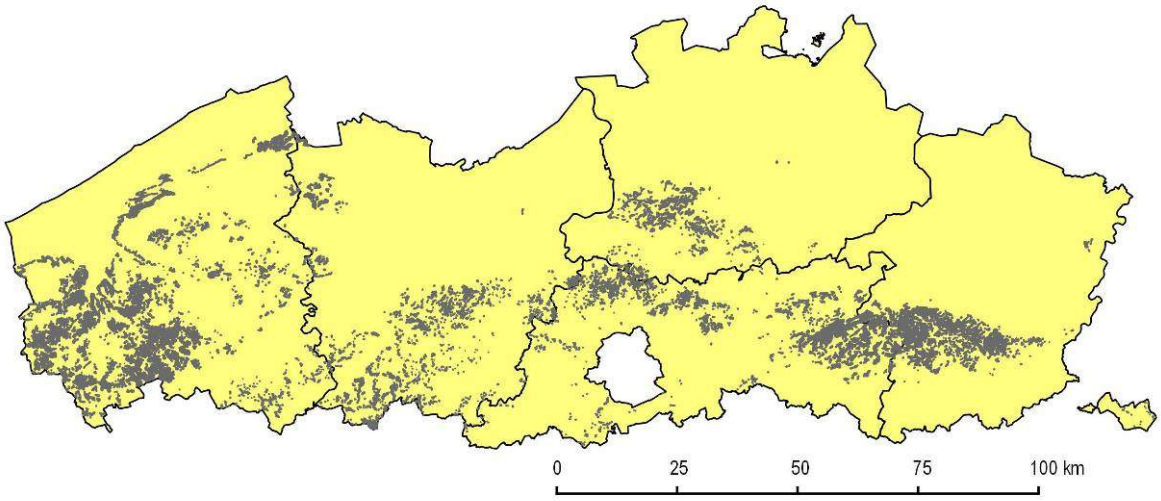

Figure 3.15 - Distribution of Stagnosols in the Flemish region

Phaeozems

Phaeozems (Fig. 3.16) are soils with a deep, dark surface horizon at least 20 cm thick that is rich in organic matter (*Mollic horizon*) and without secondary calcium carbonate concentrations within 1 m (from the Greek, *phaios*, meaning dusk and the Russian, *zemlja*, meaning earth of land). They have a high base saturation (BS > 50% and pH > 5.5). In the Flemish region *Phaeozems* often occur in the poorly drained parts of alluvial valleys (Fig. 3.17). These soils are often used for poplar plantation (*Populus* spp.) or meadows.

Figure 3.16 - Endogleyic Phaeozem in Meerbeek; soil type Aep (province of Vlaams-Brabant)

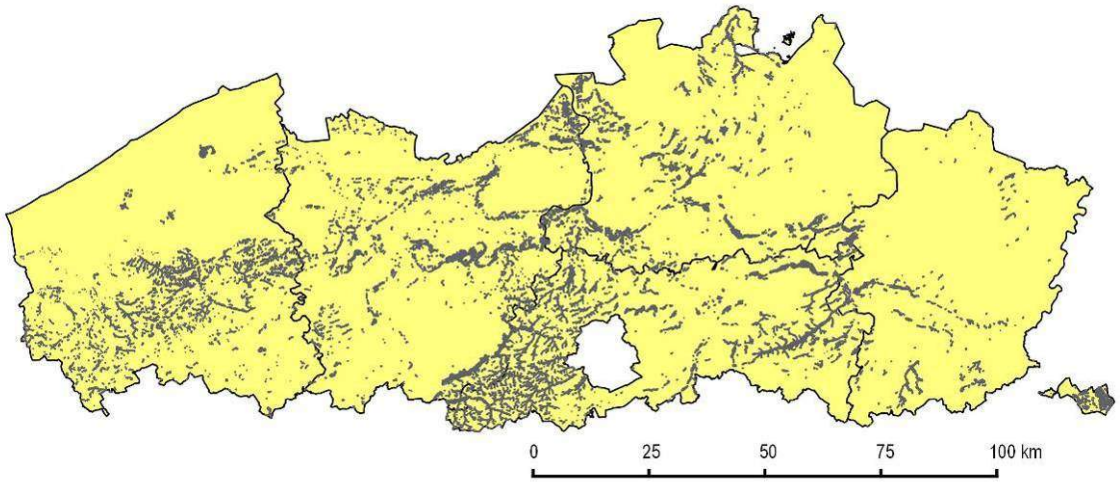

Figure 3.17 - Distribution of Phaeozems in the Flemish region

Umbrisols

Umbrisols (Fig. 3.18) are soils rather similar to *Phaeozems* but the thick organic rich surface horizon has a low base saturation (*Umbric horizon*, BS < 50% and pH < 5.5). In the Flemish region, they are most common in the Campine region where they occur in the poorly drained valley bottoms, often associated to *Histosols* (Fig. 3.19).

Figure 3.18 - Gleyic Umbrisol, soil type Pfp, in Bree (province of Limburg)

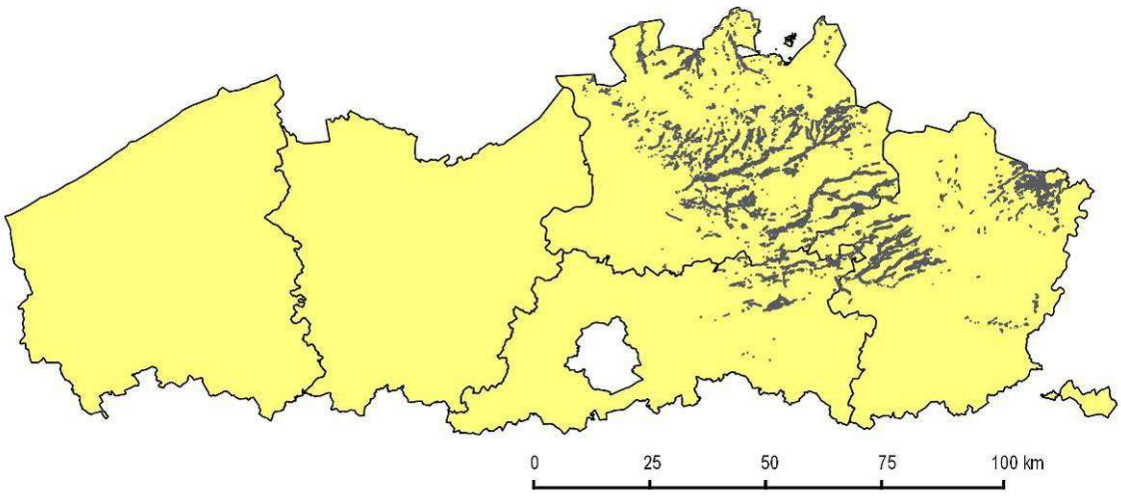

Figure 3.19 - Distribution of Umbrisols in the Flemish region

Retisols

Retisols (Fig. 3.20) are soils with a clay-enriched subsoil and *retic* properties. *Retic* properties refer to the interfingering of coarser-textured, lighther coloured parts (*albic material*) into a finer-textured *argic* horizon that has stronger colours. *Stagnic* properties

can be present with or without reducing conditions. The former *Albeluvisols* with their albeluvic glossae now are part of the *Retisols*. In the Flemish region they are most common in soil type with texture class **L..** (zandleem). In silty soils (texture class **A..**, they are typically found in old, broadleave forests as in the Zonien forest and Meerdaal forest (Fig. 3.21).

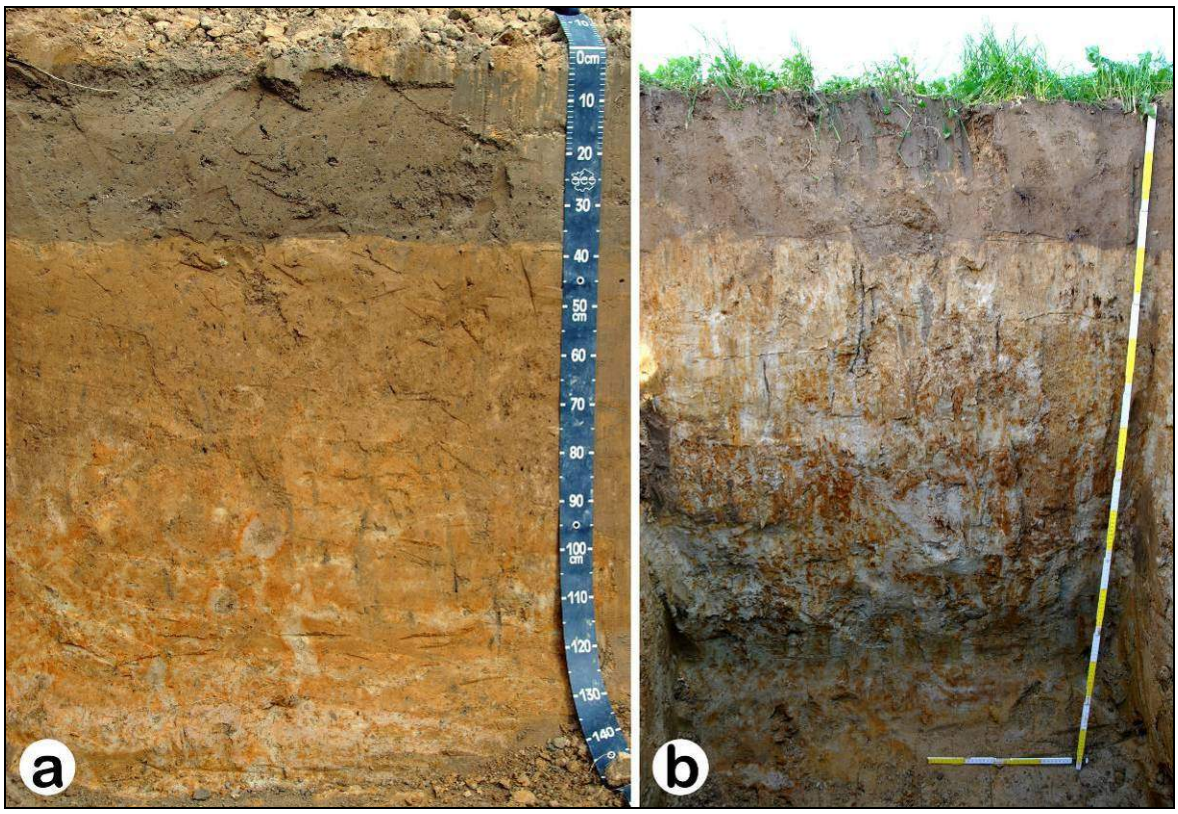

Figure 3.20 – (a) Eutric Retisol soil type Pbc, in Wevelgem (province of West-Vlaanderen); (b) Eutric Endogleyic Retisol, soil type Ldc, in Alken (province of Limburg)

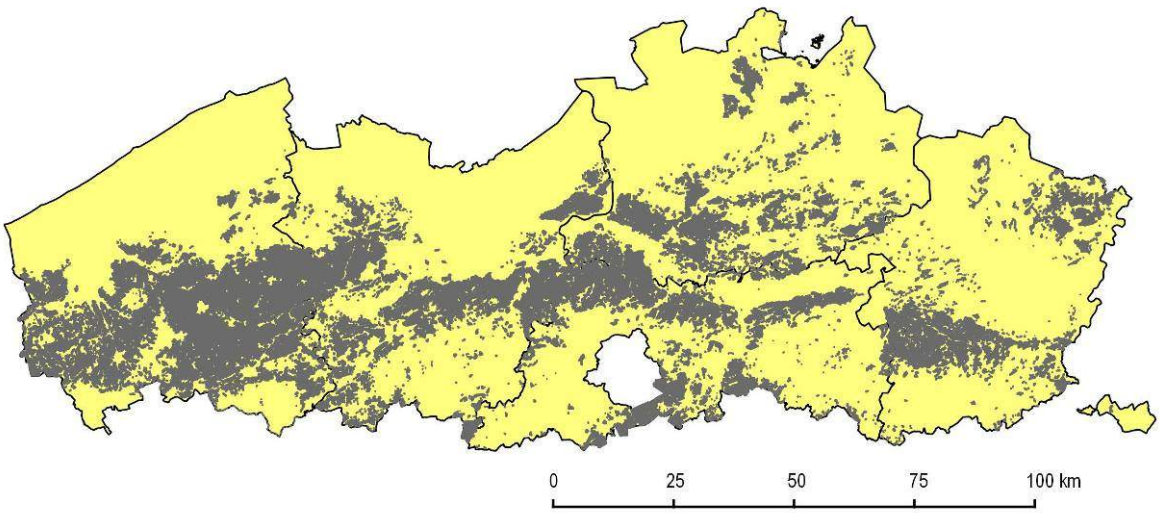

Figure 3.21 - Distribution of Retisols in the Flemish region

Alisols and Luvisols

Alisols are soils with a subsurface horizon of high activity clay accumulation and low base saturation (BS < 50%, pH-H_2O < 5.2) (from the Latin, *alumen*, alum and referring to their high content of exchangeable Aluminium). *Luvisols* (Fig. 3.22) (from the Latin, *luere*, meaning to wash) are morphologic similar soils but with high base saturation (BS > 50%, pH-H_2O > 5.5). *Alisols*, only appear as a sizeable area in the soil district "**Krijtplateau**" (Fig. 3.23); while *Luvisols* are the dominant soils in the loess belt (Fig. 3.24). Small patches of *Alisols* can however occur in the loess belt under forest.

Both *Alisols* and *Luvisols* show marked textural differences within the profile. If the soil has not been disturbed, under the humus rich surface horizon (Ah), a horizon depleted in clay occurs (E horizon), below which a subsurface horizon occurs where clay illuviated (Bt horizon). These soils generally occur on well drained landscapes.

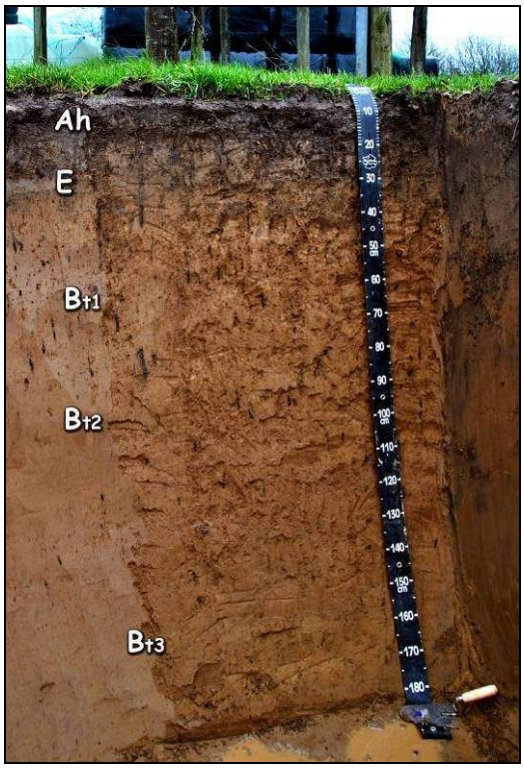

Figure 3.22 - Haplic Luvisol, soil type Aba0, in Ninove (province of Oost-Vlaanderen)

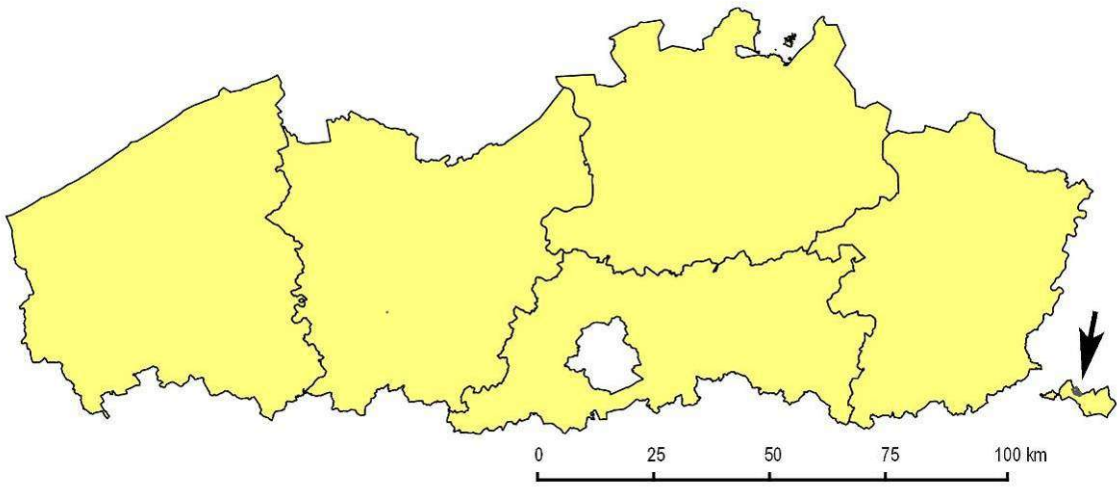

Figure 3.23 - Distribution of Alisols in the Flemish region; the arrow points to Alisols area in the soil district "Krijtland"

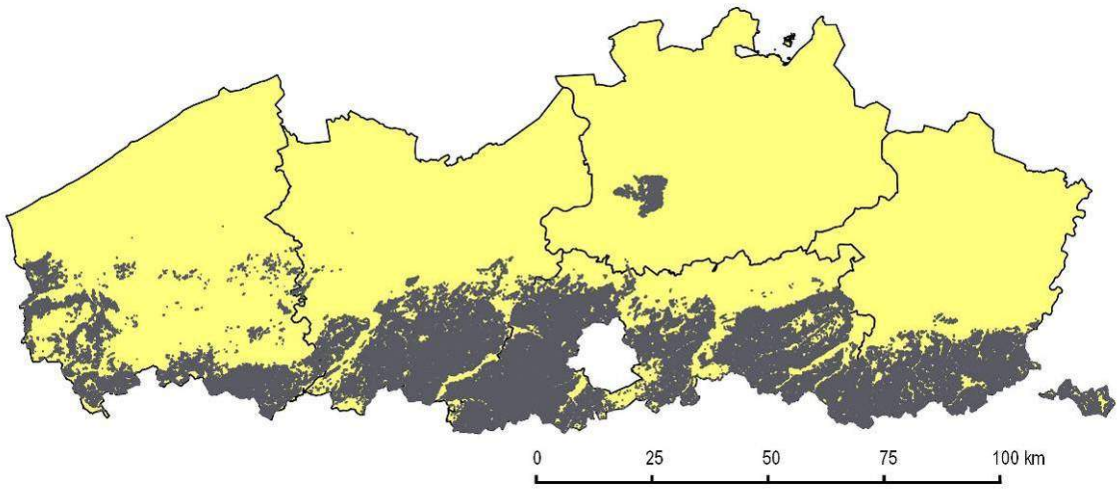

Figure 3.24 - Distribution of Luvisols in the Flemish region

Cambisols

Cambisols (Fig. 3.25) are soils that have only moderately developed profile on account of limited age or rejuvenation of the soil material (from the Latin, *cambiare*, meaning to change). Pedogenic processes are evident from colour development and/or structure formation below the surface horizon. They occur in a wide variety of environments and under all kinds of vegetation. *Cambisols* can be very productive agriculturally, especially in loess areas.

In the Flemish region, a first part of the *Cambisols* are *Fluvic Cambisols* (Fig. 3.25a; Fig 3.26a) found in valley bottoms as well as in the polder areas; another part occurs at footslopes or in dry valleys in colluvial deposits um e.g. the *Endogleyic Cambisol (Colluvic)* presented in Fig. 3.1.

A third part of *Cambisols* are soils with anthropogenic material less than 50 cm thick, and with no other diagnostic features, except for a Cambic horizon which may be present. Such soils are either *Plaggic Cambisols* (BS < 50%) (Fig. 3.25b) or *Terric Cambisols* (BS > 50%).

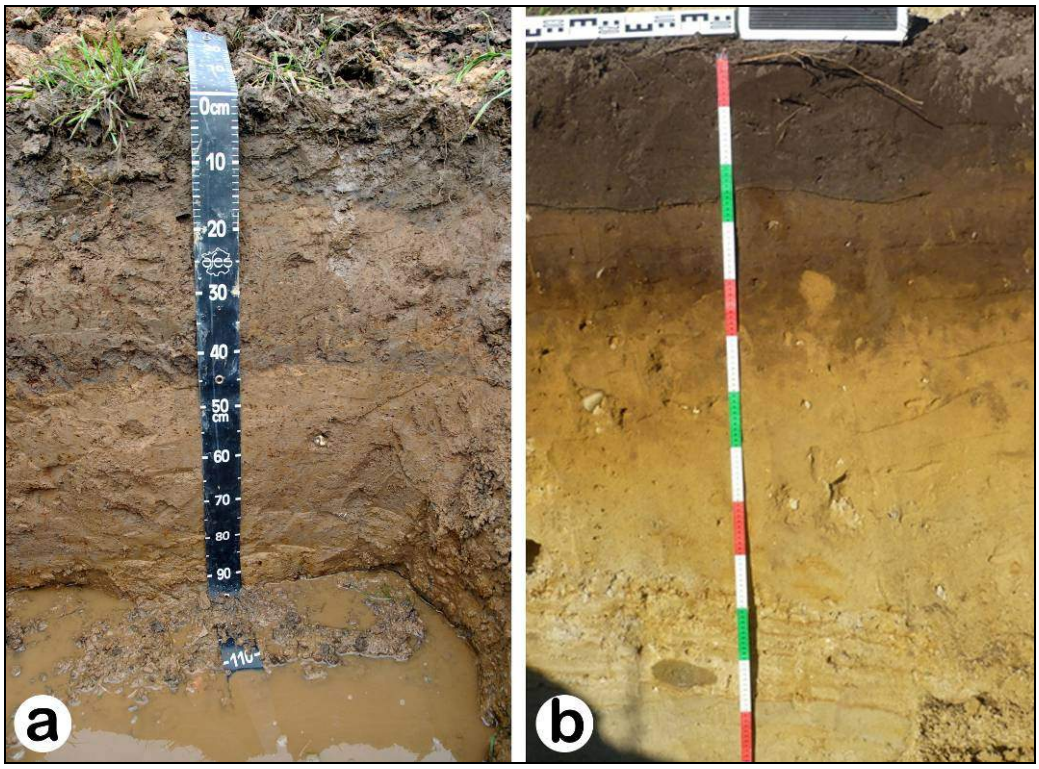

Figure 3.25 - (a) Fluvic Gleyic Cambisol, soil type Adp in Heverlee (province Vlaams-Brabant); (b) Plaggic Cambisol, soil type Sbf3 in Overpelt (province of Limburg) (photo HAAST, Rik van de Konijnenburg)

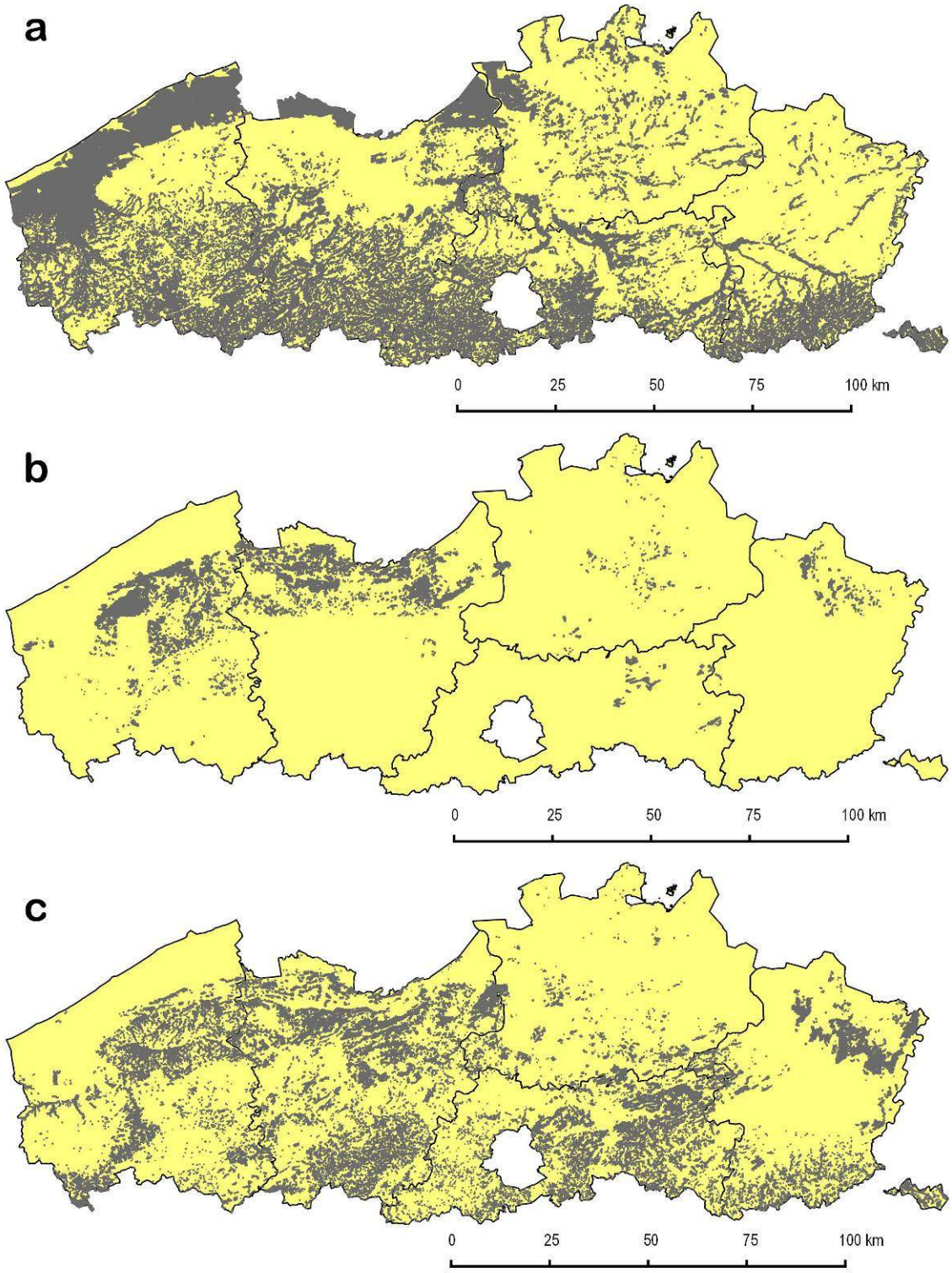

Figure 3.26 - Distribution of Cambisols in the Flemish region; (a) Fluvic Cambisols are dominant in the polders and alluvial valleys; Colluvic Cambisols in dry valleys and footslopes; (b) Terric Cambisols and Plaggic Cambisols are found in association with Anthrosols; (c) other Cambisols

Arenosols

Arenosols (Fig. 3.27) have a coarse texture of at least 1 metre or upto a hard layer. Soil formation is limited by low weathering rate and frequent erosion of the surface. If vegetation has not developed, shifting sands dominate. Periods of stability are marked by accumulation of organic matter in the top horizon, lamellae of clay and/or humus and iron complexes. In the Flemish region they occur as coastal dunes, and in the inland in areas dominated by cover sands and former shifting dunes (Fig 3.28).

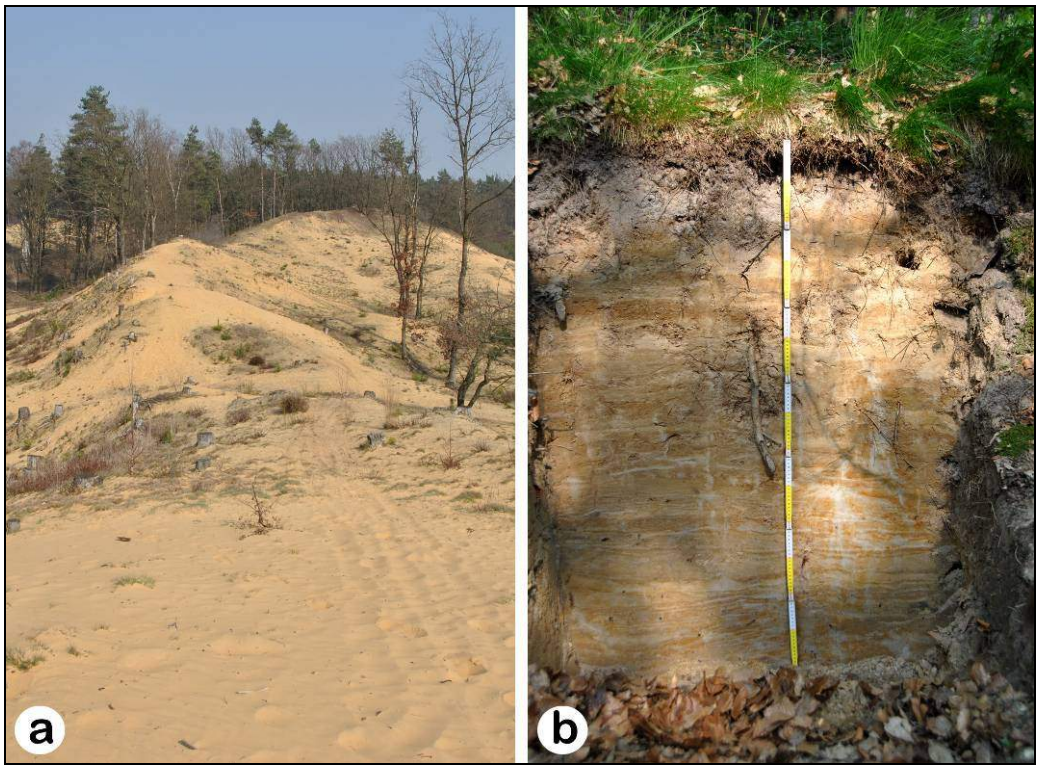

Figure 3.27 -- (a) Landscape of shifting dune sands with Protic Arenosols, soil type X in Oudsberg (province of Limburg); (b) Brunic Arenosol, soil tybe Zbc in Oud-Turnhout (province Antwerp)

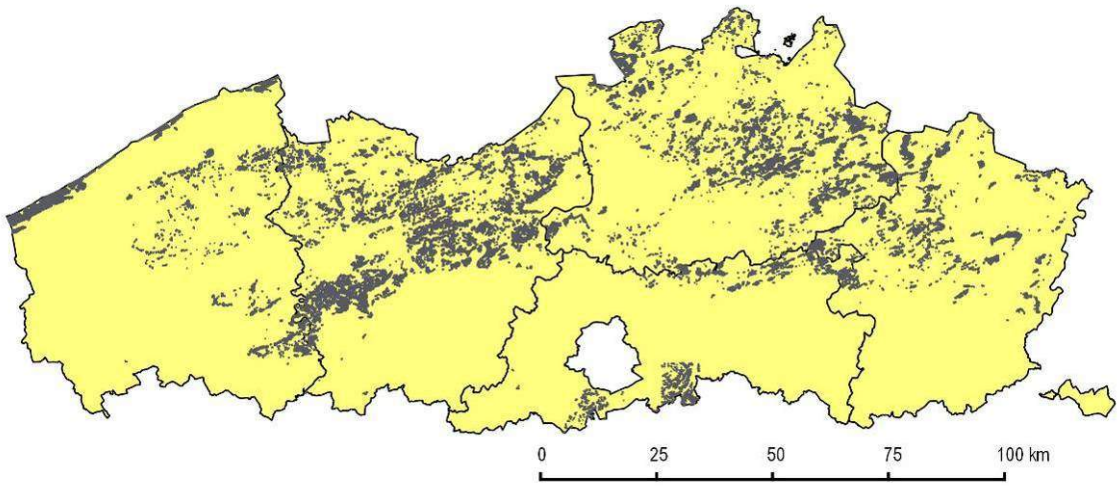

Figure 3.28 - Distribution of Arenosols in the Flemish region

Fluvisols

Fluvisols are young soils in alluvial (floodplain), lacustrine (lake) and marine deposits (from the Latin, *fluvius*, meaning river). They can be found in periodically flooded areas such as alluvial plains, valleys and tidal marshes. *Fluvisols* show layering of the sediments rather than pedogenic horizons. Their characteristics and fertility depend on the nature and sequence of the sediments and length of periods of soil formation after or between floods. *Fluvisols* are not that common in the Flemish region (Fig. 3.29) as soils developed from fluvial, lacustrine, or marine deposits, often have either a *Mollic* horizon (hence qualify as *Fluvic Phaeozem*), an *Umbric* horizon (hence *Fluvic Umbrisols*). When alluvial deposits are drained, soil formation sets in and a *Cambic* horizon quickly forms, leading to the formation of *Fluvic Cambisols*.

Regosols

Regosols are soils with limited development (from Greek, *rhegos*, meaning blanket). They form a classification rest group containing all soils that cannot be accommodated in any of the other *Reference Soil Groups*. *Regosols* profiles show thin surface horizons overlaying generally unstructured deposits. In the Flemish region many sandy soils with a fine textured substratum within the first meter, key out as *Regosols* (Fig. 3.30).

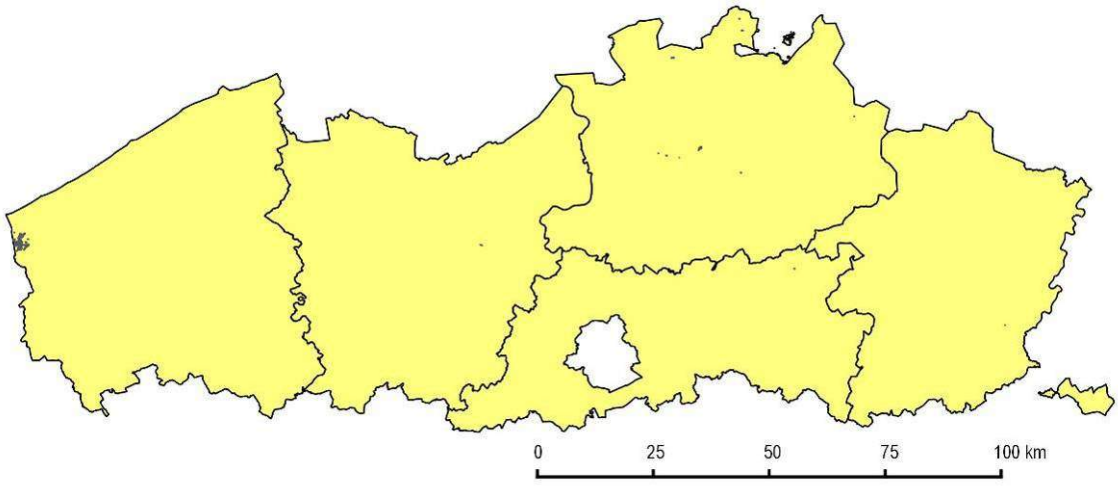

Figure 3.29 - Distribution of Fluvisols in the Flemish region

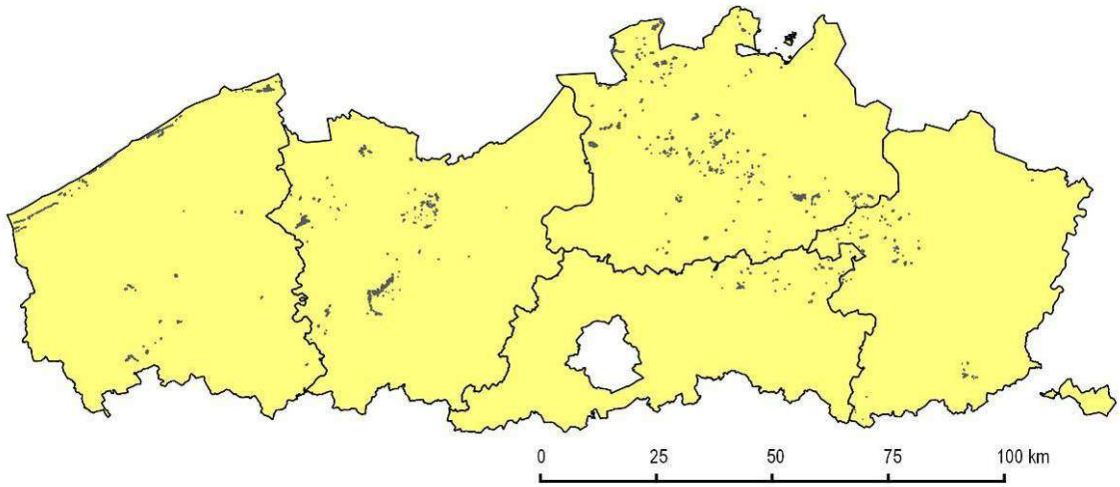

Figure 3.30 - Distribution of Regosols in the Flemish region

4. General approach

A general translation key for converting the legend of the soil map of Belgium to WRB was developed when we elaborated and tested the method (Dondeyne *et al*., 2012). However, the experience showed that such a translation often does not lead to an unequivocal conversion. Therefore, based on the insights gained from the key, and the practical knowledge acquired through classifying soil profiles, the following practical rules were applied. To take variation within the Flemish region into account – due to geology, land-use history, and differences in soil survey approach - the conversion of the **soil types** of the Flemish region has been done for 24 physiographic regions as had been defined by Honnay (1994), and further refered to as "**soil districts**".

4.1 Soil variability per soil district

From the methodological studies in preparation of this work (Dondeyne *et al*., 2012; 2013), a wide variability in soil properties per mapping units came to light. The natural variability is partly due to intrinsic variation in geology, land-use and climate, but also to differences in soil survey approaches in different parts of the country, and which also shifted over time. To take this variability into account, the **soil types** have been classified per **soil district.** The **soil districts** were adapted from the 24 "physiographic regions" defined by Honnay (1994) (Fig. 4.1).

For the coastal plain, and in line with the geomorphic units described in section 2.2, the coastal plain was further subdivided into:

- **Duinstreek** (the coastal dunes)
- **Oudland** (old land polders)
- **Nieuwland van het Zwin** (newland polders of the Zwin)
- **Middelland** (mid-land polders)
- **Oudland, overgangsgronden** (fringes of old land polders)
- **Nieuwland** (newland polders)
- **Historische polders van Oostende** (Newland, of the historical polders of Oostende)

- **Gronden op kleiig material** (clayey soils of old back swamps)
- **Landschap van de Moeren**, (old backswamps), and
- **Zwin** (tidal muds and flat of the "Zwin")

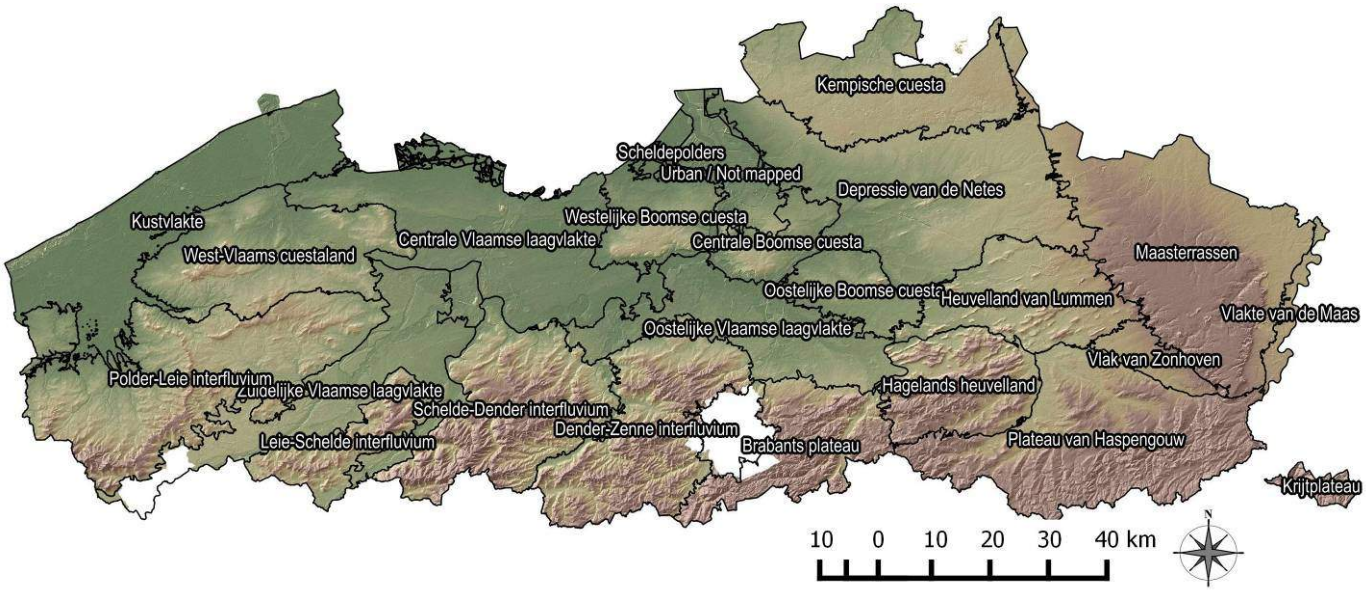

Figure 4.1 – Soil districts of the Flemish region corresponding to broad physographic units of the Flemish region (adapted from Honnay, 1994). The legend of the soil map of Belgium has been converted to WRB for each of these districts seperatly.

Overall there are 4005 different soil mapping units[9] - further called **soil types** - according to the digital soil map of the Flemish region. Ninety percent of the territory is covered by 408 **soil types**, and 95% by 671 **soil types** (Table 4.1). The **soil district** with the highest soil type diversity is the **Depressie van de Netes**; in terms of evenness the **soil districts** do however not differ all that much. The Shannon diversity index and the Evenness index are commonly used in ecology and have been proposed by Ibañez *et al*. (1995) for studying diversity in soils. Higher Shannon diversity index *H'* indicate greater soil type diversity. The evenness index *E* indicates how close in numbers each soil types are per soil district. For example if there are 20 polygons with "soil type A", and 500 with "soil type B", the soil district is not very even, while if there are 20 polygons with "soil type A" and 22 with "soil type B", the soil district is very even.

[9] This is before taking into account the (minor) corrections explained in section 6.2

Table 4.1 – Soil variability per soil district of the Flemish region, as expressed in the number of "soil types" (n), the area covered and the Shannon diversity index (H') and Evenness index (E).

Soil diversity per soil district of the Flemish region					*area covered*			
Soil district	**n**	**km2**	**H'**	**E**	**n-80**	**n-85**	**n-90**	**n-95**
Overall Flemish region	**4,005**	**18,064**	**5.2**	**0.63**	**195**	**278**	**408**	**671**
Depressie van de Netes	1,184	1,323	4.7	0.67	107	147	210	322
Heuvelland van Lummen	511	613	4.6	0.74	75	93	121	172
Maasterrassen	662	1,314	4.6	0.70	72	94	127	182
Oostelijke Boomse cuesta	415	303	4.4	0.73	64	81	109	287
West-Vlaams cuestaland	655	779	4.4	0.68	58	79	113	179
Kempische cuesta	476	737	4.4	0.71	51	64	84	124
Polder-Lele Interfluvium	673	1,314	4.3	0.67	51	69	99	161
Hagelands heuvelland	350	499	4.2	0.71	38	50	73	116
Oostelijke Vlaamse laagvlakte	556	763	4.1	0.65	55	76	105	154
Kustvlakte	308	975	4.1	0.72	42	57	77	110
Zuidelijke Vlaamse laagvlakte	418	816	4.0	0.66	38	49	67	102
Leie-Scheldo interfluvium	340	329	3.8	0.66	34	47	66	104
Schelde-Dender interfluvium	481	832	3.8	0.62	33	44	59	92
Centrale Vlaamse laagvlakte	526	1,075	3.8	0.61	32	45	68	118
Plateau van Haspengouw	413	1,069	3.7	0.62	31	43	66	110
(empty)	903	1,677	3.6	0.54	63	94	145	235
Dender-Zenne interfluvium	269	872	3.5	0.63	28	36	48	69
Westelijke Boomse cuesta	237	436	3.5	0.64	29	36	46	64
Krijtplateau	107	51	3.3	0.71	16	21	29	38
Vlak van Zonhoven	184	175	3.3	0.62	20	27	37	56
Centrale Boomse cuesta	295	297	3.2	0.56	27	39	56	94
Brabants plateau	220	616	3.0	0.56	17	25	37	59
Scheldepolders	199	320	2.9	0.54	15	19	25	40
Vlakte van de Maas	85	102	2.7	0.61	9	13	17	24
Urban / "Not mapped"	341	766	2.4	0.41	13	21	36	68

4.2 Use of legacy soil profile data

In total 540 soil profile descriptions have been checked and classified according to WRB-2007. This classification was done prior to the publication of the 3rd edition of WRB. It would have taken too much time to redo the classification, according to the newest, 3rd edition. From the insights gained from classifying all these profiles practical conversion rules were established; the classification of the 540 legacy soil profiles is presented in Annex 3.

The databases AARDEWERK-93 (Van Orshoven *et al*. 1993), and AARDEWERK-STAT (Beckers *et al*., 2012) were both used for making inferences on soil *qualifiers* per **soil type** for each of the soil districts. AARDEWERK-93 was particularly used to determine whether soil groups of a particular soil district could be classified as either *Dystric*, *Eutric* or *Calcaric*, depending on the soil pH-H_2O, as illustrated further down. The assessment

was done based on the geomatching of soil profile data with soil types represented as mapping units. The location of the profiles was taken from AARDEWERK-2010; the analytical data was taken from AARDEWERK-93.

4.3 Heuristic rules

Identification of Reference Soil Groups

The general rules which had been elaborated as part of the methodological study (Dondeyne et al., 2012; 2013) were refined and adapted to fit the classification according to the 3rd edition of WRB (Table 4.2). Overall, compared to the 2nd edition, the 3rd edition of WRB allowed for more straightforward correlation to the Belgian classification system. The main advantages were: the definition of *Retisols* corresponds better with the definition of soil profile development **..c** "with the mottled textural B horizon"; the current definition of *Gleysols* fits better the drainage class "**.g.**" (colours indicating reduced condition within 40 cm, rather than 25 cm); the definition for the textural qualifiers are now explicite (i.e. *Loamic*, was not mentioned in the previous editiosn) and could also be better correlated with the Belgian classes.

Table 4.2 – Key for identifying Reference Soil Groups based on the codes of the legend of the soil map of Belgium (as applied for the Flemish region)

Reference Soil Group	Code	Additional rule / observations
Histosols	V	
Anthrosols	**m; **h,	with "..h" as supplementary qualifier "Spodi-relocatic"
	OC	in coastal polders
Technosols / Not surveyed areas	OB, ON, OT, OE, OH,OC	
Leptosols	-	part of the ZAfe, and SAfe will be include Leptosols, but are considered too small to be mentioned
Gleysols	*g*, *G*.	Reductigleyic Gleysols
	*hp, *ip, *Ip, *hP	Oxygleyic Gleysols when occurring in valleys
	B	Oxygleyic Gleysols
	OS	Tidalic Gleysols (Zwin area in the coastal polder)
Podzols	**g; **fc; **fx. **F	but excluding *gg, taken as Gleysols

Table 4.2 – Key for identifying Reference Soil Groups based on the codes of the legend of the soil map of Belgium (as applied for the Flemish region)

Reference Soil Group	Code	Additional rule / observations
Planosols	u*h*, w*h*, u*dx, u*dP, ... uADa, gADa	typically when there is an abrupt textural change (light to heavier)
	d.Db, r.uP*, r.uS*, ...	in coastal area, based on classification of profiles
Stagnosols	*i*, *h*	*h* if not in valley position
Phaeozems	*ep, *fp,**p(v), **f2, **c2, **p3, ...	and if described in the explanatory text as having black colours and high amounts of SOC, and pH > 5.2
Umbrisols	*ep*, *fp*,*p(v), *f2, *c2, *p3, ...	and if described in explanatory text as having black colours and high amounts of SOC, and pH < 5.2
Alisols	**a	if pH-H2O < 5.2
Retisols	**c, **a(b)	if not *Z**
Luvisols	**a*, **p(c), **p1	if pH-H2O >= 5.5
Cambisols	**f, **F, **b, **x	if not *Z*.
	**p	“Fluvic Cambisols” in valleys; on slopes Colluvic, if not Gleysols, Phaeozems, or Umbrisols
	OA, OG*, OO*, OV*, OZ	in coastal polders
Arenosols	Z*x, Z*f, Z*c, Z*p	if not Zg*, or Z*g
Fluvisols	w/s-Z/S-e/f-p	soils with no structure in alluvial deposits
	r.sPm	based on soil profile classification of the coastal polders
Regosols	*Z**	Arenic soils but with substratum

Qualifiers for drainage status

A first set of refining has been made with regards to the drainage status; the rules presented in Table 4.3 were followed for all soil types.

Table 4.3 – Rules applied for converting information on drainage status as indicated in the code of the legend of the soil map of Belgium to WRB qualifiers

Code	Qualifier
a	meaning dry, indicated as "-" no qualifier
b	meaning dry, indicated as "-" no qualifier
c	meaning dry, indicated as "-" no qualifier; locally when clayey substratum present, and when mentioned in explanatory, Stagnic
A (= complex of .a. to .d.)	meaning dry, indicated as "-" no qualifier
d	(endo)gleyic, or stagnic (when clayey substratum present, and when mentioned in explanatory
e	(endo)gleyic
D (= complex of .c. + .d.)	(endo)gleyic or stagnic
f	(amphi)gleyic
g	Gleysols
h	stagnic, or oxygleyic when occurring in valleys
i, *I* (= complex of .h. + .i.)	stagnic, or oxygleyic when occurring in valleys

How the rules were applied is illustrated in Table 4.4, with a hydrosequence of soils with a *Spodic horizon* (code **..g**).

Table 4.4 – Example of convertion of drainage classes for different Soil series with a "Spodic horizon" identified with code "..g"

Soil series	Description	WRB classification
Zag	Sandy Podzols, excessively well drained, and with a clear Albic horizon	Albic Podzols (Arenic)
Zbg	Sandy Podzols, well drained, and with a clear Albic horizon	
Zcg	Sandy Podzols, moderately well drained, and with a clear Albic horizon	
Zdg	Sandy Podzols, imperfectly drained and with an Albic horizon	Endogleyic Podzols (Arenic)
Zeg	Sandy Podzols, poorly drained (and without an Albic horizon)	Endogleyic Podzols (Arenic)
Zfg	Sandy Podzols, very poorly drained	Amphigleyic Podzols (Arenic)
Zgg	Sandy Gleysols; extremely poorly drained, but with a Spodic horizon	Spodic Gleysols (Arenic)

Variations in parent material, and/or occurrence of substratum

Information on occurrence of substratum or variations in parent material implied by codes of phases or variants were interpreted as indicated in Tabe 4.5 and explicitly recorded as a *supplementary qualifier* on morphology.

Table 4.5 – Rules applied for converting information information pertaining to variations in substratum or parent material indicated as phases or variants codes

Qualifier	Code	Comments
-	***(z)	Meaning little humus, hence excluding e.g. Sep(z) of being Phaeozem, Umbrisols or Plaggic
Abruptic	wS**, wZ**, w-S**, w-Z u-Z/S/P/L/A/G	
Bathyabruptic	(w)*** ; (u)***	
Bathyruptic	(w)** (l)*** (s)***	
Histic, Mollic	**p3; ***2; ***(v)	except when taken as Plaggic/Terric, of Phaeozem
Novic	***(s)(z)	i.e. new material is covering the actual profile
Nudiargic	**a1	
Relocatic	***(o)	
Ruptic	w-P/L/A/G** s-P/L/A/G**, … Z/S**pc; Z/S**pd; Z/S**mc; Z/S**md; Z/S**mx	Also always with Planosols
Skeletic	**ge	
Terric/Plaggic	**g3	
Thaptohistic	v**, (v)**	
Western parts of the Flemish region		
Terric Anthrosols	**m	BS > 50%
Terric Anthrosols (Spodi-relocatic)	**h	BS > 50%
Terric Cambisols	**P	Terric properties (but not thick enough for "**m" and without post-podzols)
Terric Cambisols (Thapto-spodic)	**P(s)	Terric properties (but not thick enough for "**m" and without post-podzols)
Terric Cambisols (Spodi-relocatic)	**G	Terric properties (but not thick enough for "**m" and with post-podzols)
Provinces of Antwerpen, Limburg, Vlaams-Brabant		
Terric/Plaggic Cambisol	**f(p)	
General rules for sandy soils		
Brunic Arenosols	Z*x	
Brunic/Stagnic/… Regosols	*Z*x	
Cambisols	*P*x	
Cambisols	*G*x	

For the soil district **Krijtland** the following additional rules were applied

Code	Description (Dutch)	Qualifier
G..1	substraat diep 80-120 cm; cf. (x)...	Bathyruptic
G..2	substraat ondiep 40-80 cm	Ruptic
G..3	fase heel stenig > 50%	Skeletic
G..4	substraat < 40 cm	Ruptic
G..5	stenig, niet dieper dan 20-40 cm	Skeletic, Ruptic
G..6*	heel ondiep, stenen aan de oppervlakte	Leptosols
nuG..		Abruptic
uG..		Abruptic

**does not occur within the Flemish region*

Qualifiers pertaining to base saturation

The qualifiers *Dystric, Eutric* and *Calcaric* convey some basic information on the soil fertility status. *Dystric* implies that the base saturation (by 1 M NH4OAc) of the soil in the major part between 20-100 cm is less than 50%; while *Eutric* implies that it is more than 50%. A soil is *Calcaric* when it has free $CaCO_3$ (>2%) throughout between 20 and 100 cm depth. However, as base saturation has only been determined for a very limited number of the legacy soil profiles, the soil pH-H_20 was taken as a proxy. Based on the correlation which had been found between the pH value and base saturation (Dondeyne *et al*., 2012), the following rules were used:

- *Dystric*, when average soil pH-H_2O, per soil type and per soil district is smaller than 5.2
- Either *Dystric* or *Eutric* when soil pH-H_2O is in the range 5.2-5.5; but a particular choice was made based on the general trend per soil district and the neighbouring soil types; in general *Dystric* in the Campine region in eastern parts of the Flemish region, particularly the soil districts of “Depressie van de Netes”, “Heuvelland van Lummen”, and “Maasterrassen” are considered to be predominantly *Dystric*.
- *Eutric*, when soil pH-H_2O is in the range 5.5 - 8.0
- *Calcaric*, when soil pH-H_2O is above 8.0 and/or when in the explanatory booklets the presence of $CaCO_3$ is mentioned to be typical for that soil type.

For “border cases”, preference was given to indicate the soil type as *Eutric*, on the consideration that due to the practise of manuring and fertiliser over the last decades most soils will have been subject to eutrification. Properties of neighbouring **soil types** were

also taken into account – e.g. soils with profile development **..m** in landscape setting with *Podzols* (mapped as ..g) were taken to be *Plaggic Anthrosols*.

Table 4.6 illustrates how soil types with soil texture class **S..** and soil profile development **..f** were evaluated to be either *Dystric* or *Eutric* per soil district. Generalisation is further done, taking soil texture into account and the modal values per district; in the example below "**S.f**" are considered to be *Dystric* in the soil district "Maasterrassen", while those of the soil district "West-Vlaamse cuestaland" are *Eutric*.

Table 4.6 – Ilustration of classification of "S.f" soil types for two physiographic regions, in Dystric or Eutric based on their soil pH-H2O status and derived from the AARDEWERK-93 database through geomatching process

Soil district	Soil type	Average pH-H2O	Evaluation
Maasterrassen	t-Scf1	4.27	Dystric
	t-Sbf1	4.53	Dystric
	Scf1t	4.57	Dystric
	t-Scf	4.82	Dystric
	Sbft	4.86	Dystric
	Sbf	5.03	Dystric
	Scft	5.19	Dystric
	t-Sbf3	5.25	Dystric
	Scfz	5.44	Eutric
	t-Sbf	5.92	Eutric
West-Vlaams cuestaland	SdF2z	5.52	Eutric
	SdF2	5.78	Eutric
	SdF	6.04	Eutric
	w-SdF2	7.59	Eutric

Qualifiers pertaining to soil texture

The qualifiers *Arenic, Loamic, Siltic,* and *Clayic* regroup broad soil textural classes, referring to the soil textural classes as defined by FAO. The definitions of these qualifiers and their correspondence with the Belgian soil textural classes are shown in Fig. 4.2.

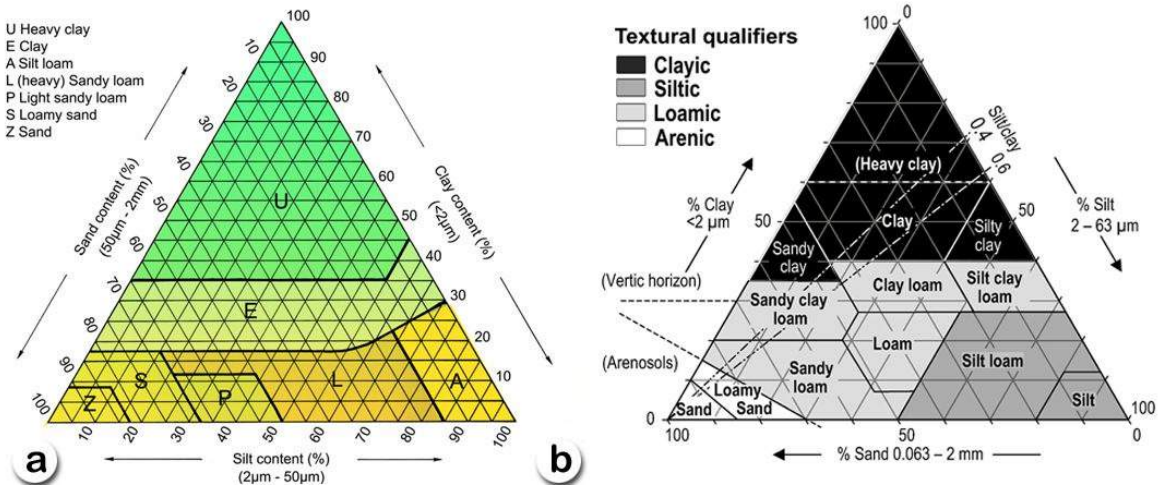

Figure 4.2 – (a) Definition of Belgian textural classes, compared to (b) the qualifier classes Clayic, Siltic, Loamic and Arenic as defined in the 3rd Edition of WRB; note the English names for the Belgian classes are propsed as "best proxys"; the original names are given in Fig 2.2.

As the correspondence between Belgian textural classes, and the FAO classes is not a one-to-one relationship, the general rules presented in Table 4.7 were applied. Where Belgian textural classes, or the symbol used for complexes may correspond to different qualifier classes, this was indicated with a "/"; e.g. **G..** can be *Loamic* or *Siltic*; the complex to **E-A** will be *Loamic* or *Siltic*, respectively; both cases are indicated as *Loamic/Siltic*.

Table 4.7 – Conversion of soil texture class symbol, or specific landscape symbol, to textural qualifiers

Soil texture class, or landscape symbol	Qualifier
$	$
A	Siltic
A-L	Siltic/Loamic
A-S	Siltic/Loamic
A-U	Siltic/Clayic
A-U-S	Siltic/Clayic/Loamic
A-Z	Siltic/Arenic
B*	Siltic/Loamic or Siltic/Clayic; depending on neighbouring soil textures, per soil district
E	Loamic
E-A	Loamic/Siltic
E-L-Z	Loamic/Arenic
E-Z	Loamic/Arenic
G	Loamic/Siltic
G-Z	Loamic/Arenic
L	Loamic
L-P	Loamic

Table 4.7 – Conversion of soil texture class symbol, or specific landscape symbol, to textural qualifiers

Soil texture class, or landscape symbol	Qualifier
L-P-Z	Loamic/Arenic
M*	completed based on neighbouring soil textures
N*	Loamic (as described in booklet, 106e, p. 41)
P	Loamic
P-Z	Loamic/Arenic
S	Loamic
S-P-E	Loamic
S-Z	Loamic/Arenic
U	Clayic
U-A-L	Siltic/Clayic/Loamic
U-A-M	Siltic/Clayic
U-A-S	Siltic/Clayic/Loamic
U-L	Loamic/Clayic
U-L-S	Loamic/Clayic
U-S	Loamic/Clayic
V*	$
V-E	Loamic
X*	Arenic
Z	Arenic

note: symbol $ is used for "no value/no class"; e.g. in the case of the urban areas ("Technosols / unsurveyed areas");

* specific landscape symbols, e.g. "B" for water springs

4.4 Convertion of the mapping units of the coastal polders and dunes

To convert the mapping units of the coastal plain (including the polders and dunes), the unpublished correlation key elaborated by Chris Vynckier and Carole Ampe in 2010 was used as a base (Annex 2). The 166 mapping units of that table were first converted to *Reference Soil Groups*, with the corresponding *prefix* and *suffix qualifiers* as defined in WRB 2007 and which was in the first instance based on the classification of 201 legacy soil profile descriptions according to WRB-2007 (Annex 4). In the final classification of the mapping units, the equivalent for each mapping unit was converted following the 3rd edition of WRB. When available at least three to four profiles were classified for each mapping unit (Table 4.8). For the mapping units with no matching soil profiles, i.e. neither class nor geo-matching, the classification was taken of mapping units with similar soil properties, and for which the correlation table of Vynckier & Ampe was taken as a reference, together with the corresponding definitions of the mapping unit as described by

Van Ranst & Sys (2000). For the few mapping units of the coastal areas which were not included in the "Vynckier &Ampe list", the explanatory booklet of the original map sheets were consulted to capture the soil properties of the mapping units. Mapping units lacking corresponding soil profiles were less frequent classes, covering restricted areas.

Table 4.8. - Example of selected soil profiles which were classified according to WRB-2007; wherever possible 3 to 4 profiles per mapping unit were classified

Profile	Mapping unit[1]	Original soil type[2]	AW93 type[3]
037W69	m.P1	Type P1 (oud symbool LG2)	P1
022E40	m.P1	Type P4 (ZG1)	P4
022W68	m.P2	Type (O)P2 (LG1)	P2
024W10	m.P3	Type P3 (ZG2)	P3
024W12	m.P3	Type P3 (ZG2)	P3
051E35	m.P3	Type P3 (oud symbool PG2)	P3
065E31	m.P3	Type P3 (oud symbool PG2)	P3
051E54	m.P3	Type T3 (oud symbool ZGYY)	T3
051E34	m.P4	Type P4 (oud symbool PG1)	P4
066W25	m.P4	Type (O)P4 (PG1)	P4
066W67	m.P4	Type (O)P4 (PG1)	P4
036E50	m.P5	Type (M)P5 (P2B)	P5
037W48	m.P5	Type P5 (P2B)	P5
037W68	m.P5	Type P5 (P2B)	P5
065E39	m.P5	Type P5 (P2)	P5
022E55	m.Pb2	Type Pb2 (6Vp)	Pb2
022W55	OG1	D3E type	Zgp0
036W42	OG1	G2 type	G2
036W43	OG1	Type O2Z	G2Z

[1] Mapping unit as coded in the digital soil map

[2] Soil type as mentioned on the original soil profile description

[3] Soil type as coded in the database Aardewerk-93

5. Conversion to WRB units

5.1 Classification of soil profiles

The 540 legacy soil profiles classified according to WRB-2007 were used as a guiding reference when applying the conversion principles. The classification of these profiles is presented in Annex 3. *Qualifiers* which are not foreseen as a standard in the WRB classification for the given *Reference Soil Group*, are indicated with an asteric "*". Examples are the use of the qualifier **Loamic*, which is not explicitly foreseen as a *qualifier* for the soil texture, but also for example **Humic*, which is not foreseen for *Albeluvisols*, or **Plaggic* which is not foreseen for *Arenosols*, nor for *Podzols*. When constructing the legend according to WRB-2014 however, the use of "not-foreseen" *qualifiers* was not necessary anymore.

The correspondence between "soil types" from the legacy soil profile descriptions and WRB can not be used directly for converting the "soil types" of the mapping units. First, the original classification of the legacy soil profiles has been done in different phases over time, during which the classification systems have been modified. The classification of four profiles, given in Table 5.1 illustrates the type of difficulties which were encountered:

- Profile 103E27, has been coded as a soil type "**Aba1**" in AARDEWERK-93; this corresponds neatly with the classification in WRB of a *Cutanic Luvisol (Nudiargic, Siltic);* the soil type given in the soil profile description refers to an older classification (**A1a**), and does not allow any direct conversion; the soil type indicated by the mapping unit is of a different kind as it : soil type **Abp(c)** is understood to be a soil with an argic horizon (within one meter) buried under colluvial material, hence a *Cutanic Luvisol (*Colluvic, Siltic)*; so *Colluvic* rather *Nudiargic*.
- However, whereas in this first example the soil type indicated in AARDEWERK-93 corresponds better with the WRB classification than the one of the mapping unit, for the soil profiles 103W06 and 050W34, none do really correspond nicely to what could be expected; according to the soil profile description 103W06 has no *argic* horizon – so an "**Aba**" was not an appropriate classification. It is actually a highly eroded *Luvisol*, were the remains of the former lower part of the *argic* horizon is now just

below the plough layer. This horizon meets the requirements of the *Cambisols*, but so this soil has no colluvial material as one would expect from the mapping unit "**Abp(c)**". The author[10] of the soil profile description even classified the profile as a "*Regosol*, Brown forest soil".

- The fourth example (067E12), just as the previous one (050W34), illustrates that profile development "**..c**" does not necesseraly implies the presence of an *argic* horizon. The mapping unit **wPbc** of profile 067E12 at least conveyes the information of the presence of a lithologic discontinuity; and is in this case therefore closer to the WRB classification of a *Haplic Cambisol (Ruptic).*

Table 5.1 – Ilustration of discrepancies between the different classifications of the Belgian soil types for four soil profiles and WRB-2007 classification; AW-93 standing for the coding in the AARDEWERK-93 database

Profile	Soil type			WRB-2007 classification
	AW-93	Profile description	Mapping unit	
103E27	Aba1	A1a	Abp(c)	Cutanic Luvisol (Hypereutric, Nudiargic, Siltic)
103W06	(s)Aba1	(s)Aba1	Abp(c)	Haplic Cambisol (Calcaric, Bathyruptic, Siltic, Bathyarenic)
050W34	Ldc1	type (O)Ca6	Ldc	Endogleyic Regosol (Hypereutric, Siltic, *Drainic, *Ruptic)
067E12	Pbc0	Pbc0	wPbc	Haplic Cambisol (Ruptic, Eutric, Bathyarenic, *Loamic)

5.2 File attribute table of the conversion

The conversion of the legend of the soil map of Belgium has been applied on an overlay of the digital version of the soil map of the Flemish region (version 2001) intersected with a layer of "physiograhic systems" map prepared by Honnay (1994) to identify the "soil districts". The structure of the attribute table of this layer is presented in Table 5.2. The conversion of the 200 most common **soil types** to WRB-2014 units is given in Annex 5.

[10] The author of this profile is the late Prof. Denis Lamberts

Table 5.2 – Structure of the file attribute table of the converted version of the soil map of Flemish region converted to WRB-2014

Nr	Field names	Description	Source
1	CODEID	ID of the soil type	digital soil map of the Flemish region (2001edition)
2	STYPE	soil type (orginally labelled "CODE")	"
3	SBTR	Code of substratum (e.g. v, w, u)	Derived from digital soil map
4	TEXT	Code of texture	"
5	DRAIN	Code of the drainage status	"
6	PDEV	Code of the profile development	"
7	FASE	Code for the phase	"
8	VAR	Code for the variant	""
9	C_S_FYS	Code of the unique combination of CODEID and SDISTRICT	New code, introduced in this study
10	SDISTRICT	Soil district	Map by Honnay (1994)
11	RSG2014	Reference Soil Group	This study
12	PQ1	1st Principal Qualifier	"
13	PQ2	2nd Principal Qualifier	"
14	PQ3	3rd Principal Qualifier	"
15	SQ_DRAIN	Supplementary qualifier for drainage status	"
16	SQ_TEXT	Supplementary qualifier for texture	"
17	SQ_FERT	Supplementary qualifier for fertility	"
18	SQ_MORPH	Supplementary qualifier for morphology	"
19	RSG_CODE	Standard code for the RSG	"
20	RSG_PQ1	Standard code for RSG with 1st PQ	"
21	RSG_PQ	Standard code for RSG with all PQs	"
22	PQ1_CODE	Standard code for 1st PQs	"
23	PQ2_CODE	Standard code for 2nd PQs	"
24	PQ3_CODE	Standard code for 3rd PQs	"
25	PQ_CODE	Standard code for all PQs combined	"
26	SOILUNIT	Standard WRB name for the mapping unit, combining three Principal Qualifiers, Reference Soil Groups and supplementary qualifiers referring to soil texture and morphologic features	"
27	OBS	Observations or remarks in relation to the conversion; or correction of code	"

The WRB *Reference Soil Groups* are stored in a separate field (RSG2014) and so are the the first three *Principal Qualifiers* (PQ1, PQ2, PQ3) and *Supplementary Qualifiers* (SQ_DRAIN, SQ_TEXT, SQ_FERT, SQ_MORPH).

The sequence of the 1st, 2nd and 3rd *Principal Qualifiers* are according to the hierarchy of the WRB-2014 classification. By and large these three *qualifiers*, taken into account the

information which can be generalised from the soil map, were sufficient to convert the mapping unit. For the *Principal Qualifiers*, qualifiers which would be redundant – as the classification unit implicitly implies the presence of such a characteristic – are, as a principle excluded; e.g. a soil type **Scm** belonging to the soil unit *Terric Cambisol* is assumed to be *Eutric* as part of the definition of *Terric,* hence it would be redundant to add this as a second or three *Principal Qualifier.* However to facility queries in GIS environment the property *Eutric* is retained in the field of the *Supplementary Qualifier* SQ_FERT. WRB *Soil Unit* name retained in the field SOILUNIT, follow closely the standard rules of WRB, but with as *Supplementary Qualifiers* only the information on only the information retained in the field SQ_TEXT, followed by the information retained in the field SQ_MORPH. According to the WRB rules these should have be in alphabetic order, but for practical reasons this was not done here.

5.3 Map legends and soil classification

Map legends

As detailed maps, the original soil maps can now be used in two ways in conjunction with WRB. First of all the original mapping units can be presented as in Figure 5.1. Each of the *Reference Soil Groups* is shown with a specific colour, and labels on corresponding to the first three *Principal Qualifiers* are printed as a label on the map. In this way the most principal information in WRB terms can be represented, and the map should be legible to an international audiance.

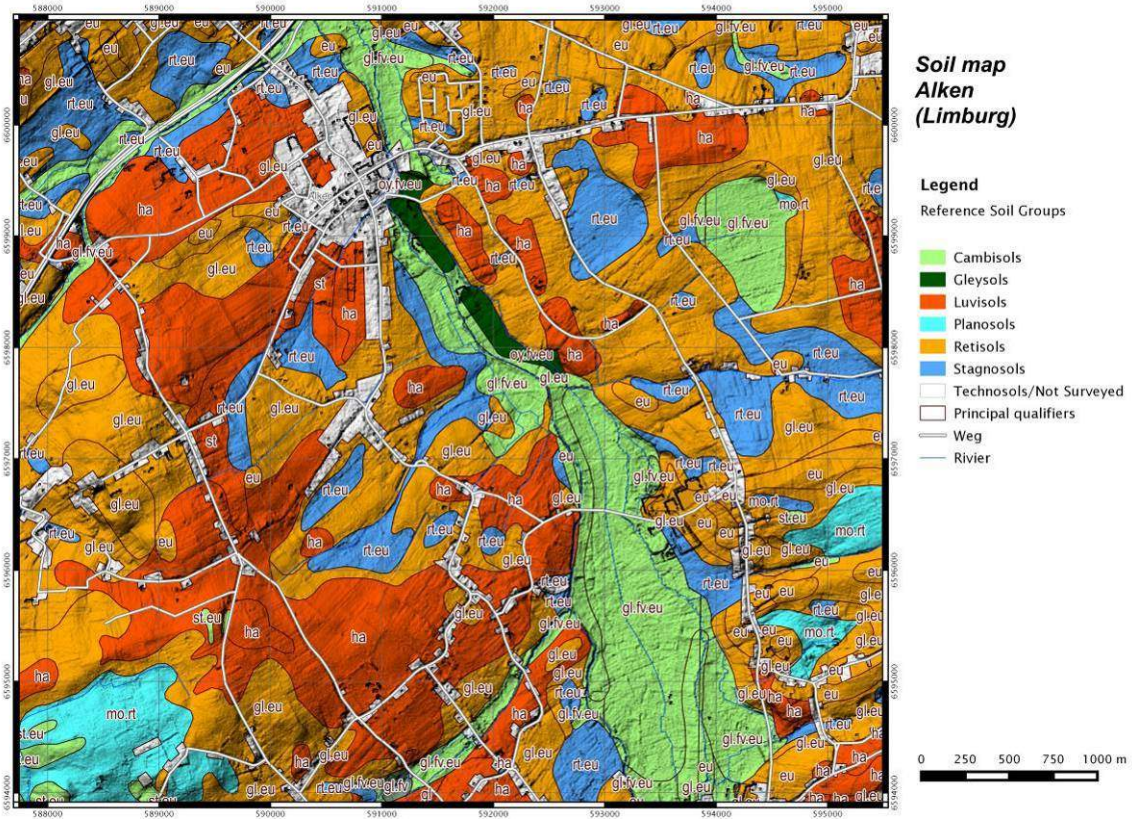

Figure 5.1 - WRB Soil Units represented with Reference Soil Groups, as a seperate colour and up to three Principal Qualifiers as labels (illustration around Alken, province of Limburg)

Another way of presenting the maps is to present the original **soil types** as labels in combination with the *Reference Soil Groups*, as in Fig. 5.2. This representation has the advantage that map users familiar with the Belgian legend, can immediatly derive the detailed information the original legend provides (particularly on texture, drainage status, and the possible occurence of substratum), while the colours give insight into the pedogenetic similarities in the landscape.

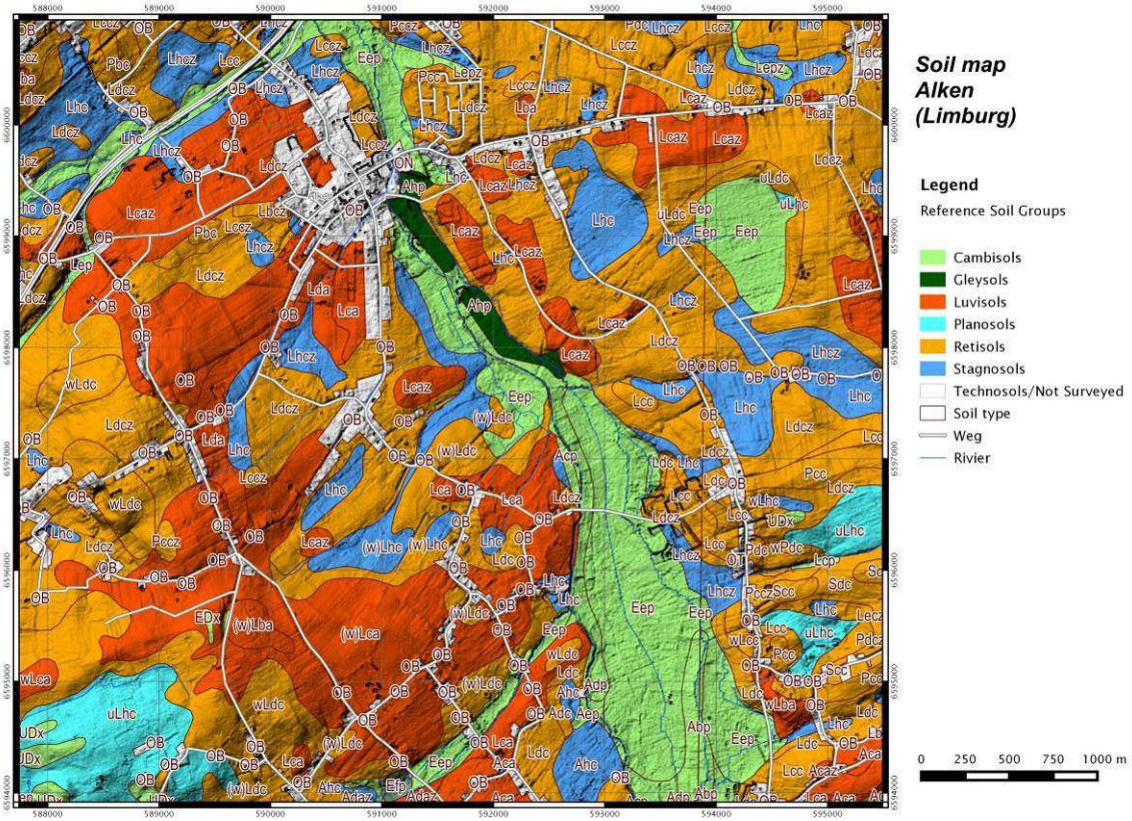

Figure 5.2 - Soil types of the of the digital soil map of the Flemish region combined with Reference Soil Groups

In this way the original soil maps can be neatled presented as at a 1 : 40 000 scale, as illustrated in the additional sample maps.

Soil classification

Map users might be interested to report the soil classification for a particular site based on the legend. Table 5.3 illustrates how, by applying the rules for soil classification as set-out in the 3rd edition of WRB (IUSS Working Group WRB, 2014), for each soil type per soil district the information on *Reference Soil Groups* and *Qualifiers* can be used to determine the name of the *Soil Unit* by including both *Principal* and *Supplementary Qualifiers.* However, it should be realised that the soil at any particular site may differ from the map legend; and that some qualifiers, e.g. *Humic*, have not been retained for constructing the map legend. The field SOILUNIT in the GIS Attribute Table provides already this information; if more detailed information is required e.g. in relation to drainage status, the other supplementary fields can be used to this end. For example **Adc** in soil district

Oostelijke Vlaamse laagvlakte, (first case in Table 5.3) belongs to the Soil Unit *Eutric Gleyic Retisols (Siltic)*, but could also be refered to as *Eutric Endogleyic Retisols (Siltic).*

Table 5.3 (a) Example of the GIS attribute table with Soil type (STYPE) per soil district (SDISTRICT) and corresponding Reference Soil Groups and Principal (PQ..) and supplementary qualifiers (SQ_...)

CODEID	STYPE	SDISTRICT	RSG_2014	PQ1	PQ2	PQ3	SQ_DRAIN	SQ_TEXT	SQ_FERT	SQ_MORPH
279	Adc	Oostelijke Vlaamse laagvlakte	Retisols	Gleyic	Eutric	-	Endogleyic	Siltic	Eutric	-
517	Lbaz	Dender-Zenne interfluvium	Luvisols	Haplic	-	-	-	Loamic	Eutric	Ruptic
630	Lep	Maasterrassen	Cambisols	Gleyic	Fluvic	Eutric	Endogleyic	Loamic	Eutric	Fluvic
951	Pep	Vlak van Zonhoven	Cambisols	Gleyic	Fluvic	Dystric	Endogleyic	Loamic	Dystric	Fluvic
1248	Scgz	Oostelijke Boomse cuesta	Podzols	Albic	-	-	-	Loamic	Dystric	-
1258	Scm	Kustvlakte	Anthrosols	Terric	-	-	-	Loamic	Eutric	-
1374	Sdh	Dender-Zenne interfluvium	Anthrosols	Terric	-	-	Endogleyic	Loamic	Eutric	Spodi-relocatic
3434	uPcc	Plateau van Haspengouw	Retisols	Eutric	-	-	-	Loamic	Eutric	Abruptic
3479	uSdP	Kustvlakte	Cambisols	Terric	Gleyic	-	Endogleyic	Loamic	Eutric	Abruptic
3747	w-Pdp	West-Vlaams cuestaland	Cambisols	Stagnic	Eutric	-	Stagnic	Loamic	Eutric	Ruptic
4266	wSdfc	Brabants plateau	Podzols	Stagnic	-	-	Stagnic	Loamic	Dystric	Abruptic

Table 5.3 (b) Example of Soil Units name determined from the Reference Soil Groups, Principal Qualifiers and supplementary qualifiers refering to soil texture, and

CODEID	STYPE	SOILUNIT
279	Adc	Eutric Gleyic Retisols (Siltic)
517	Lbaz	Haplic Luvisols (Loamic, Ruptic)
630	Lep	Eutric Fluvic Gleyic Cambisols (Loamic, Fluvic)
951	Pep	Dystric Fluvic Gleyic Cambisols (Loamic, Fluvic)
1248	Scgz	Albic Podzols (Loamic)
1258	Scm	Terric Anthrosols (Loamic)
1374	Sdh	Terric Anthrosols (Loamic, Spodi-relocatic)
3434	uPcc	Eutric Retisols (Loamic, Abruptic)
3479	uSdP	Gleyic Terric Cambisols (Loamic, Abruptic)
3747	w-Pdp	Eutric Stagnic Cambisols (Loamic, Ruptic)
4266	wSdfc	Stagnic Podzols (Loamic, Abruptic)

5.4 Supplementary qualifiers

The *supplementary qualifiers* have been included mainly with the GIS user in mind. They provide interesting insights into the variation in drainage, texture and fertility status within the Flemish region as illustrated in Figure 5.3.

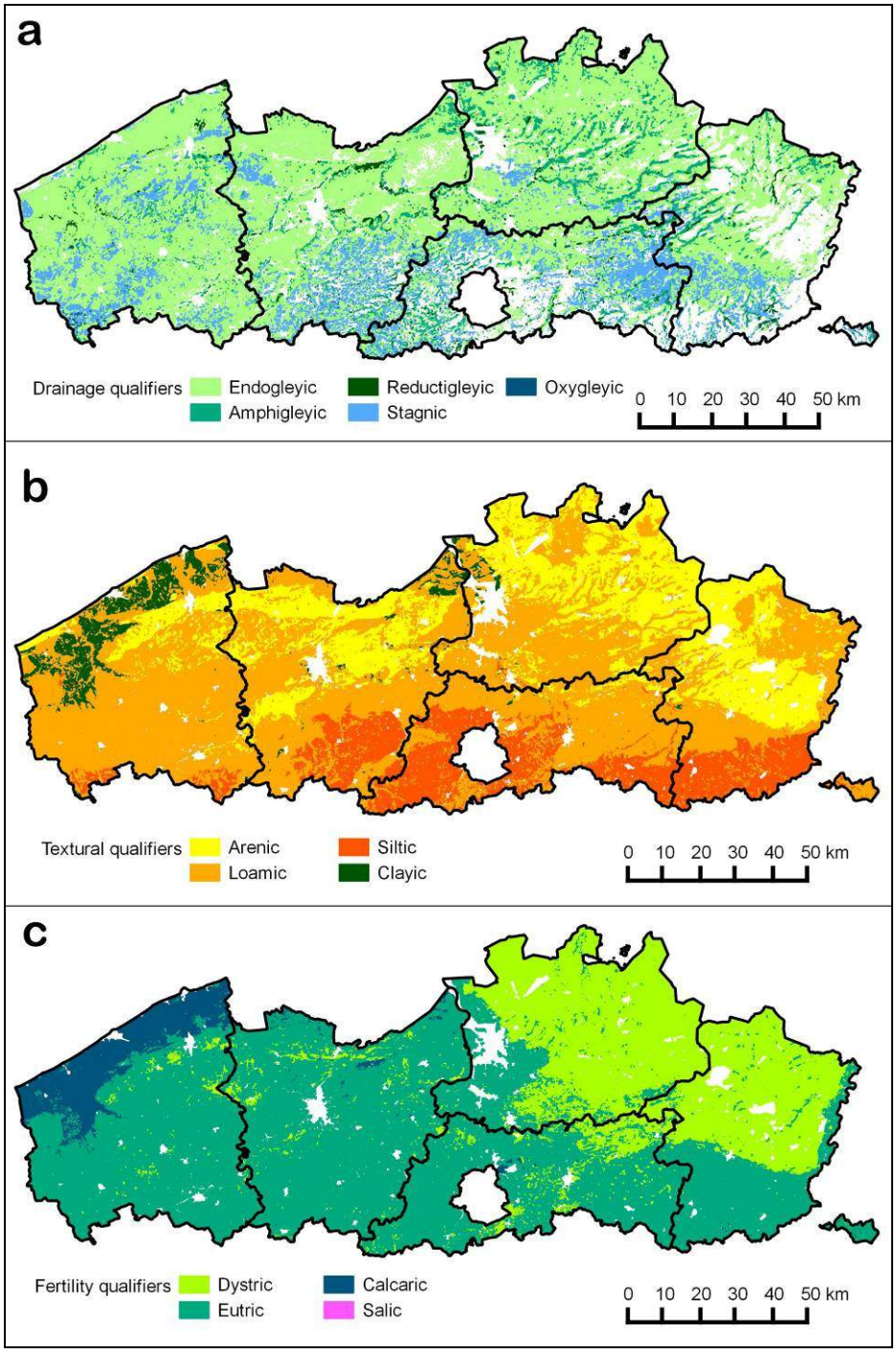

Figure 5.3 - Geographic variation in drainage, texture and fertility status as retained in the WRB Supplementary Qualifiers

5.5 Generalisation to 1 : 250 000 scale map

A generalised map for the whole Flemish region at a 1 : 250 000 scale (Fig. 5.4), whereby the WRB legend was used as the basis for generalisation. Whereas, so far, all GIS operations were done in QGIS (version 2.4), these operations were done in GRASS (version GRASS GIS 6.4.4) available through the QGIS interface.

First, the detailed digital soil map was converted to a raster image with a resolution of 20 × 20 m, and with the *Reference Soil Groups* in combination with the first *Principal Qualifiers* as data entry. Subsequently, a filter operation was performed to weed out smaller units. This was done using the "***r.neighbors"*** [method=***mode***] function and

- first with neighborhood size 11
- once more with, mode; neighborhood size 5, and
- once more with, mode; neighborhood size 3

The resulting raster image was converted back to vector format with the function "***r.to.vect***", and then smoothened with the function "***v.generalize***" [method = ***snakes method for line smoothening***]

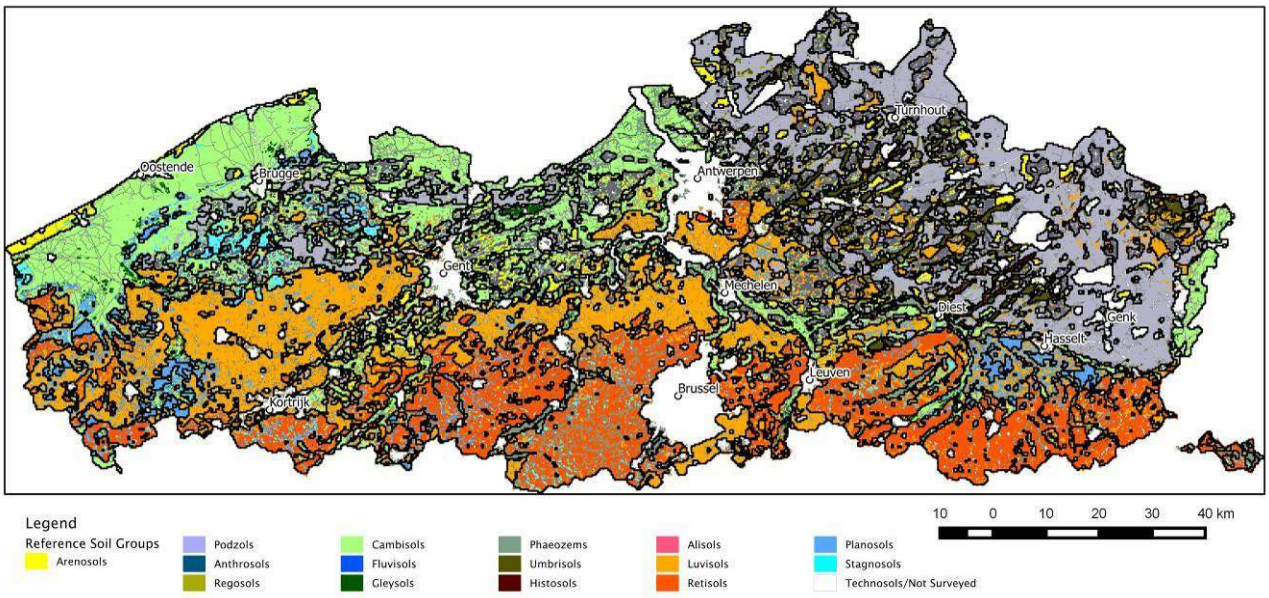

Figure 5.4 – Illustration of the process for creating a generalised map based on Soil Units (Reference Soil Groups + PQ); the polygons are generalised units, the colour legend are from the original map

This operation lead to the creation of broader units whereby in most cases one *Soil Unit* is dominating (i.e. covers more than 50% of the area) the polygon, but whereby parts of other *Soil Units* may be included. The latter are the *associated Soil Units* and of which the two most frequent have been retained in the GIS attribute table. Figure 5.5 illustrates the correspondence between the original *Reference Soil Groups* and the dominant *Soil Units* of the generalized map. Table 5.4 describes the fields of the attribute table. The final map is presented on a 1 : 250 000 scale.

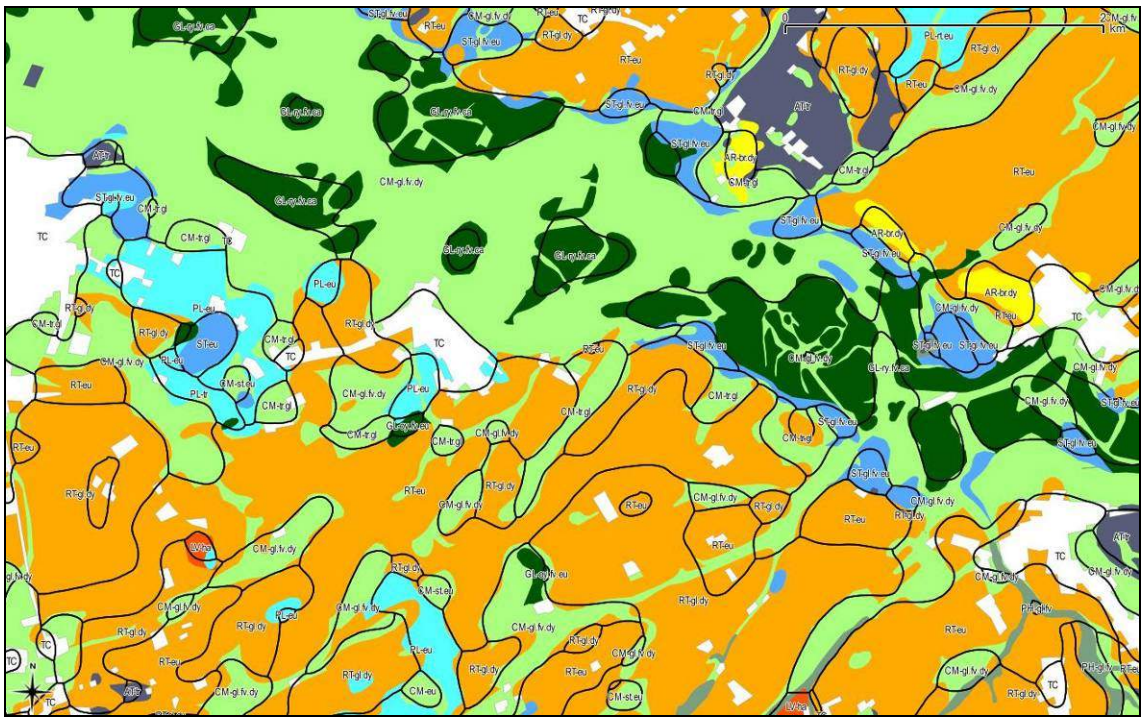

Figure 5.5 – Detail of the generalised map; the colours corresponding with the original converted Reference Soil Group; the polygons and the labels indicate the dominant Soil Unit

Table 5.4 Fields of the GIS attribute table of the generalised soil

A_DN	ID numer, unique per dominant RSQ + PQ1
RSG_PQ_D	Standard WRB code of Referene Soil Group + principal qualifiers
RSG_DOM	Standard WRB code of dominant Reference Soil Group
PQ_DOM	Standard WRB code of Principal Qualifier of dominant RSG
RSG_2014	Full name of dominant Reference Soil Group
A1_RSG	Standard WRB code of 1st associated Reference Soil Group
A1_PQ	Standard WRB code of Principal Qualifier of 1st associated RSG
A1_RSG_PQ	Standard WRB code of RSG + principal qualifiers of 1st associated Soil Unit
A2_RSG	Standard WRB code of 2nd associated Reference Soil Group
A2_PQ	Standard WRB code of Principal Qualifier of 2nd associated RSG
A2_RSG_PQ	Standard WRB code of RSG + principal qualifiers of 2nd associated Soil Unit

6. Discussion and conclusions

6.1 General considerations

By converting the original legend of the Soil Map of Belgium to WRB-2014, we correlated the concept of **soil type** - as a variant, or a phase of the **soil series** - with *Reference Soil Groups*. The *Reference Soil Groups* can can further be subdivided into *Soil Units*, by combining them with up to *Principal Qualifiers*; additionally GIS users can access and query more detailed information using the *Supplementary Qualifiers* as these are stored in four thematic database fields. These fields are represent data which could be deduced from the legacy soil survey data, on drainage status, soil texture, chemical soil fertility (*Dystric*, *Eutric*, *Calcaric*) and soil morphologic features (*Abruptic*, *Ruptic*, *Fluvic*, *Colluvic*, ...).

The Belgian classification system is open, not hierarchical system; WRB has only two levels: the *Reference Soil Groups* and the *Soil Units*, which are defined by the combination of *Reference Soil Group* names with *Principal Qualifiers*, and if desired *Supplementary Qualifiers*. With this conversion and correlation, the Belgian **soil types** of the soil map of the Flemish region are fitting into WRB on a "third level" of classification. Hence the outcome of the conversion has not lead to a merely "translation" but really has been a re-interpretation of the original soil maps.

Though in the Belgian classification systems, **soil types** are considered to be phases and/or variants of the **soil series** - defined by texture, drainage and profile development - in WRB these "variants" often come out in different *Reference Soil Groups* or as distinct *Soil Units*. For example the soil type **Adp0** located on a footslope in the soil district **Brabants plateau** is an *Endogleyic Cambisol* (*Colluvic*), while soil type **Adp(c)** also on the footslopes in the same soil district will be an *Endogleyic Luvisol (Colluvic).*

The combination of the original legend with the international classification system, should make the soil map of Belgium better accessible to a wider international audience, and should also help soil scientist working with the soil map of Belgium to communicate their results internationally. The knowledge of the spread of *Reference Soil Groups* which had

so far had not been well reported in the Flemish region, such as the *Phaeozems*, *Umbrisols*, *Planosols*, *Stagnosols* and *Terric Anthrosols*, shed new light on the soil geography of the Flemish region. These soils are of particular in interest in relation to soil organic carbon content and hydrology.

6.2 Observations and encountered difficulties

Soils with profile development "..h"

The **soil types** with profile development "**..h**" had been described and defined as "post-podzols". Therefore, at first these were considered to be *Podzols* rather than to be *Anthrosols*. These soil types cover wider areas, particularly in the northern part of the province of Oost-Vlaanderen; e.g. soil type **Zch** ranks 10th amongst the most common soil types in terms of area (Table 6.1). Still, the legacy soil profiles included in the database AARDEWERK do not include any soil profile classified with such a profile development.

Table 6.1 - Twelve most common soil types in the Flemish region (excluding build-up areas)

Rank	Soil type	Area (km²)
1	Ldc + Ldcz	617
2	Aba1	615
3	Zdg	360
4	Zcg	231
5	Pcc	193
6	Lca	191
7	X	185
8	Ldp	179
9	Eep	175
10	Zch	174
11	Pdc	168
12	Abp	146

However, in the explanatory booklets, Sanders & Ameryckx (1988, p. 80-81) for example correlate **Sch** and **Sdh** soil types and their variants, to *Plaggeptic Haplohumod* in Soil Taxonomy. These authors do clearly recognize the anthropogenic nature of these soils, though they still include them in *Podzols* (or *Spodosols* in Soil Taxonomy). However, as in the explanatory texts it is often mentioned that the anthropogenic layers are at least 50 cm thick, soil types with profile development **..h** have been converted to *Terric Anthrosols*.

Errors in the digital soil map

While converting the soil types to WRB units, almost all observed errors were corrected in the digital soil map; one digitalisation error was however not corrected, as explained below.

Corrected errors

For example in the soil district **Depressie van de Netes** (commune Geel), Polygon with POLY_ID 177279, had been coded as having soil type **Zeg(o)**, which is indeed as it appears on the printed map. However in the explanatory text of the soil map[11], it has been indicated that this was a printing error and that this unit should have been soil type "**Zep(o)**"

Map sheet 29E

POLY_ID 22678 had been coded as soil type **Zbm3**; as phase "**…3**" in general indicates the occurrence of an organic rich anthropogenic layer of less than 60 cm, this does not make sense in combination with **Zbm**, which implies the presence of an anthropogenic layer of more than 60 cm (Fig. 6.1). As in the explanatory booklet, the soil type **Zbm3** is not mentioned either, the most logic explanation is that during the map production process the hatching of the neighbouring polygon mapped as **l-Sdc3(h)** was unintentional extended to the polygon ment to be **Zbm**.

[11] Bayens L. (1975, p. 45). Verklarende tekst bij het kaartblad 30E Kasterlee, Centrum voor Bodemkartering, IWONL

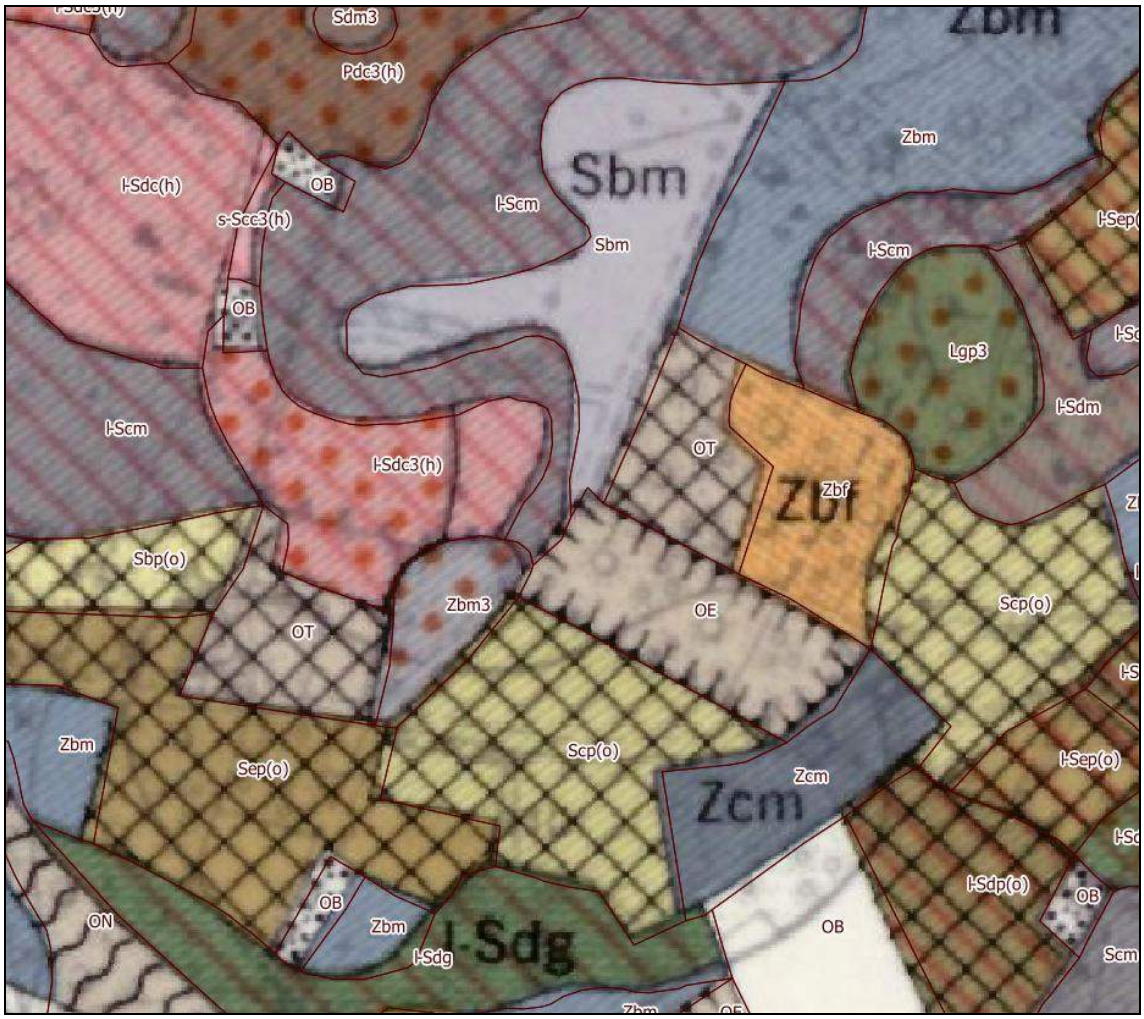

Figure 6.1 - The code "…3" as for "Zbm3" does not make any sense; it seems that the "red dots" of l-Sdc3(h) run-over into the Zbm polygon; therefore the code has been corrected to Zbm

Map sheet Beringen 62W

CODE_ID 2044, had been coded soil type **Zde**, this was corrected to **Zdc**, as on the original printed map

CODE_ID 2045 had been coded soil type **Zdey**, this was corrected to **Zdcy**

Map sheet Tervuren 102E

CODE_ID 3099 had been coded soil type **sSAAx,** this was corrected to **sAAx**

Map sheet Erps-Kwerps 89W

CODE_ID 235 had been coded soil type **Abc(c)** but was corrected to **Abp(c)** – as on the paper map

Map sheets Westerlo 60E , Geel 45E

CODE_ID 1464 had been coded soil type **Sege**, this was corrected to **Segx**

CODE_ID 1365 had been coded soil type **Sdge**, this was corrected to **Sdgx**

Map sheet Kortesem 92E

CODE_ID 3577 had been coded soil type **vAca**, this has been corrected to **wAca**

Map sheet 23E and 24W

CODE_ID 2609 had been coded as soil type **m.Bc3,** this was corrected to **z.Bc3**

Soil profile development "..d"

A small number of soil types of the Flemish region had been coded to have soil profile development **..d**. Soil profile development **..d** defines soils with a "**yellow-redish Bt horizon**". These soil types do occur in the southern part of the Walloon region, but do not occur in the Flemish region. Mapping units which had been coded with soil profile development **..d** were corrected to a more logical soil type taking kind of neighbouring soil type into account as illustrated in Fig. 6.2.

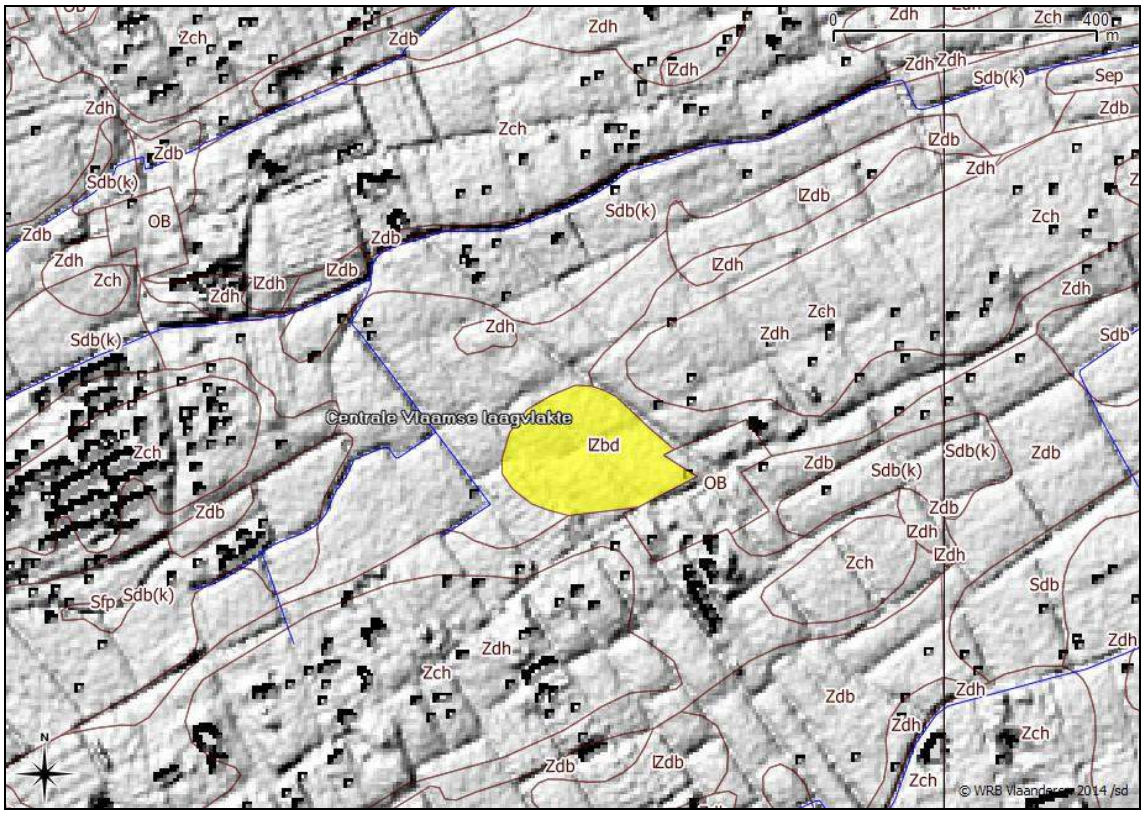

Figure 6.2 - Map unit "lZbd" – profile development "..d" is very unlikely here; more likely that this should have been "lZdb" as neighbouring polygon is mapped as "Zdb"

Map sheet Berlaar 44E

Polygon with CODE_ID 3679, had been coded soil type **w-Lcfc**; a silt-loam soil (L..) where all neighbouring soils are sandy, is rather unlikely; more over such a silt-loamy texture in combination with soil profile development "**..fc**" would be rather remarkable. Unfortunately this map sheet has never been published. As in the explanatory text the mapping unit **w-Lcfc** is not mentioned, this has been corrected to **w-Scfc**.

Not corrected error

As illustrated in Fig 6.3, on map sheet 32E Neerpelt, some of the original polygons have not been digitized. This error has not been corrected as in WRB the missing units just as the present ones all key out as *Endogleyic Podzols*.

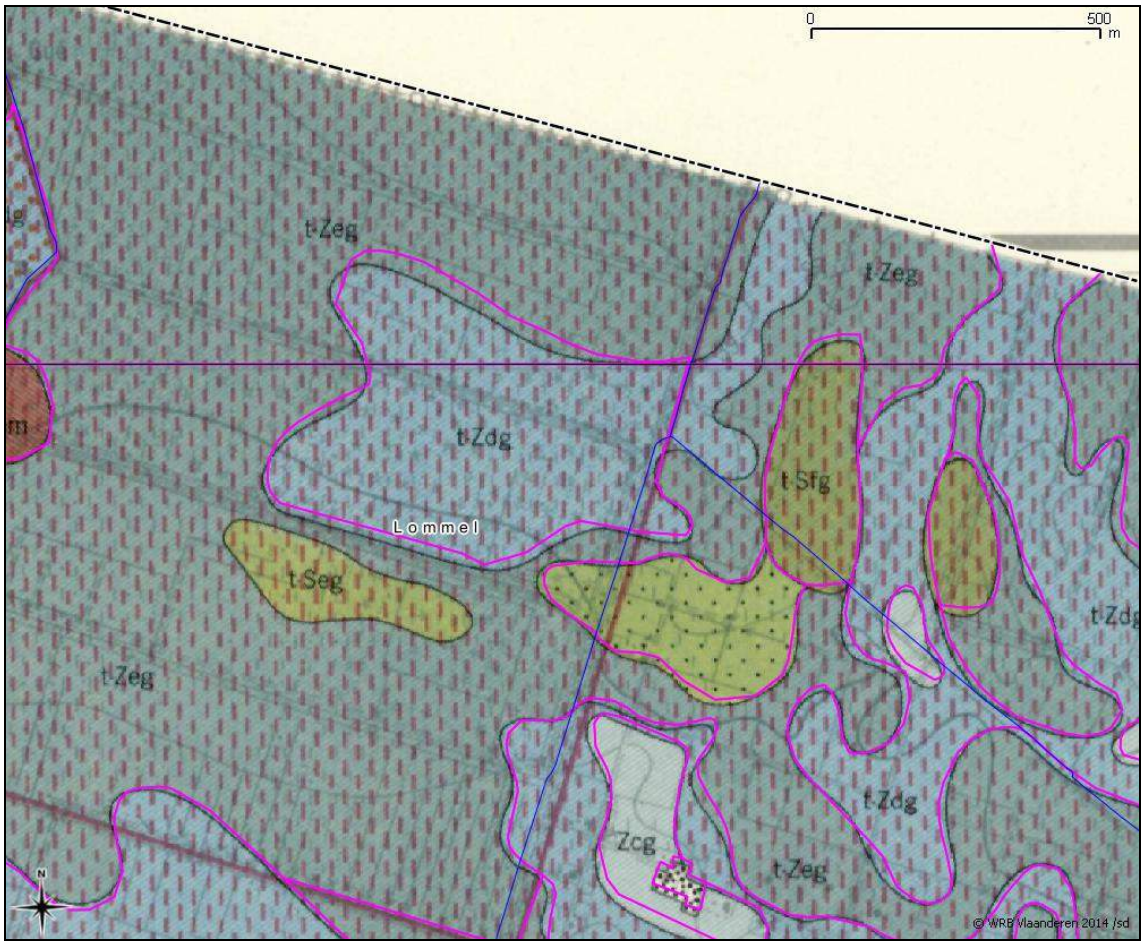

Figure 6.3 – Some polygons of the original soil map of sheet 32E Neerpelt, have not been included in the digital soil map..

6.3 Limitations of the current maps

The current map with a WRB legend presents some limitations depending on the nature of the legacy soil survey data. Firstly, some characteristics which in WRB are rather important for classification were given less attention during the soil survey (e.g. *Stagnic* properties; *Dystric/Eutric* properties), and had to be inferred from circumstantial data. Secondly, as the soil survey has been carried out over almost 40 years and implemented by hundreds of people, inevitably some inconsistencies in the use of the legends' symbols and in the cartographic representation happened. Thirdly, given that the soil surveyors used 19th century cadastral maps to orient themselves in the field, some of the boundaries of the mapping units are questionable. Fourthly, as some of the maps are based on data and field observations of sometimes more than 50 years ago, some major land-use changes have affected the soils. Most drastic are expansion of building area and large infrastructural

worls; drainage of swamp and peatlands; creation of quarries, waste dumpsites, ponds or reservoirs. With our current knowledge, new mapping tools and new techniques of data gathering – ranging proximal sensing, to LiDAR, remote sensing and additional detailed field observations (e.g. at archeologic excavation sites) – it should now be possible to update and improve our legacy soil data.

Nature of legacy data

Qualifiers such as *Dystric*, and *Eutric* have been attributed based on the AARDEWERK database – hence legacy data – and often on rather limited set of soil profiles per mapping unit; these are at present the best data at hand. Locally, the base saturation of a particular site may differ from the generalisation we made; and overall it would be useful to update such information. The occurrence of some of the *qualifiers* is not well known based on the current survey data. For example the qualifier *Humic* is applicable to a wide set of soil types – but no systematic pattern as a combination of soil type and soil district was recognised. Therefore the qualifier *Humic* was not retained for elaborating the legend of the soil map.

Cartographic inconsistency

The example Figure 6.4 shows that soils which on map sheet 50E have been indicated to have soil texture **L..** and profile development **..c,** have been mapped as having soil texture **A..** and soil profile development **..p** on map sheet **51W**.

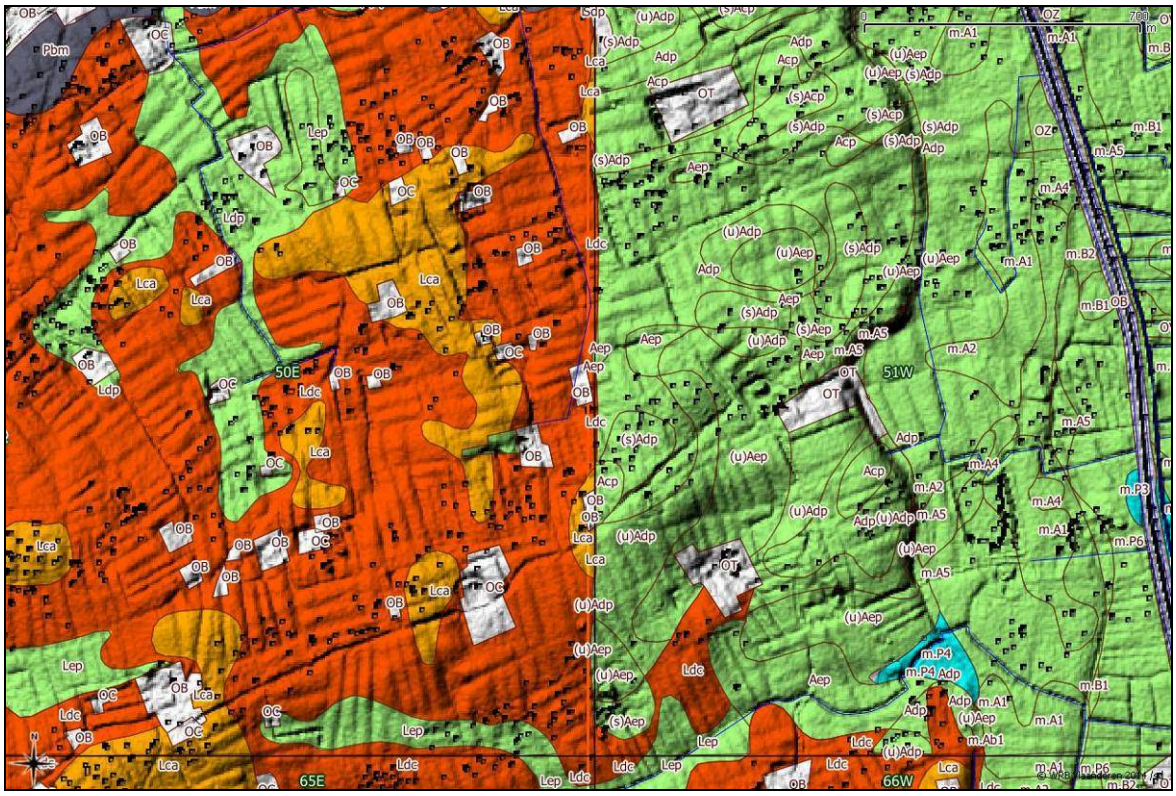

Figure 6.4 - Cartographic inconsistencies between maps sheets in the original soil map leads to inconsistencies in the WRB legend: soil types with profile development "..c" are considered to be Retisols on map sheet 50E (left), have been mapped as having soil profile development "..p" are considered to be Cambisols on map sheet 51W (right)

Accuracy of the original maps

At various sites it has been obvious that the original soil maps were not always all that accurate. A first type of inaccuracy has to do with the location of mapping boundaries; in Figure 6.5 the white arrow points to a mismatch between soil mapping units and the topography as can be seen on the shaded terrain image derived from LiDAR data. A second type is inaccuracy of classification units. The soil profile in the Figure below is observed in a large mapping unit of soil type **Aba0.** This soil type should correspond to a *Luvisols* not affected by erosion, nor covered by colluvium. In reality the soil had 60 to 80 cm of colluvium; soil type **Abp(c)** would have been more appropriate in this case.

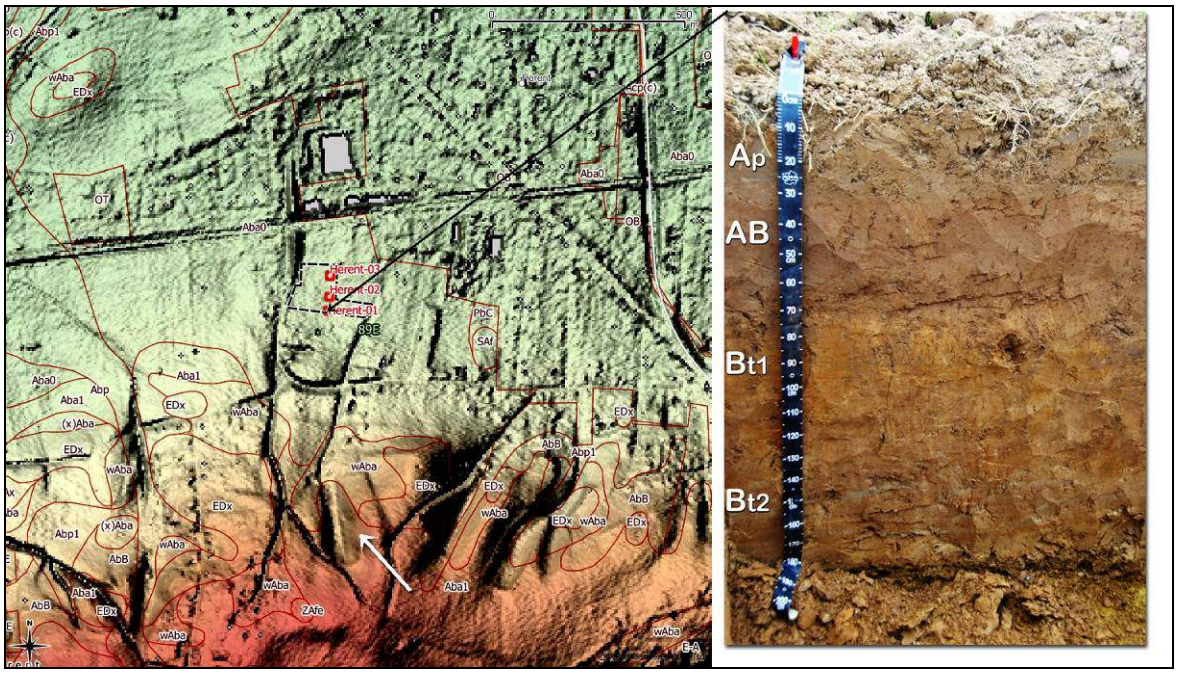

Figure 6.5 – Illustration of inaccuracies of the original soil map around Herent (province of Vlaams-Brabant); the white arrow on the map points to inconsistency in the location of the map unit boundary taking the topography into account; the horizons Ap and AB consistitute 70 cm of colluvium whereas the mapping unit Aba0 would imply a soil not affected by erosion nor by colluvium

Land-use changes

Finally, Fig. 6.6 illustrates that due to land-use changes over the past 50 years, the soil map of the Flemish region do not always represent actual soil cover, and that there is a need to get it updated.

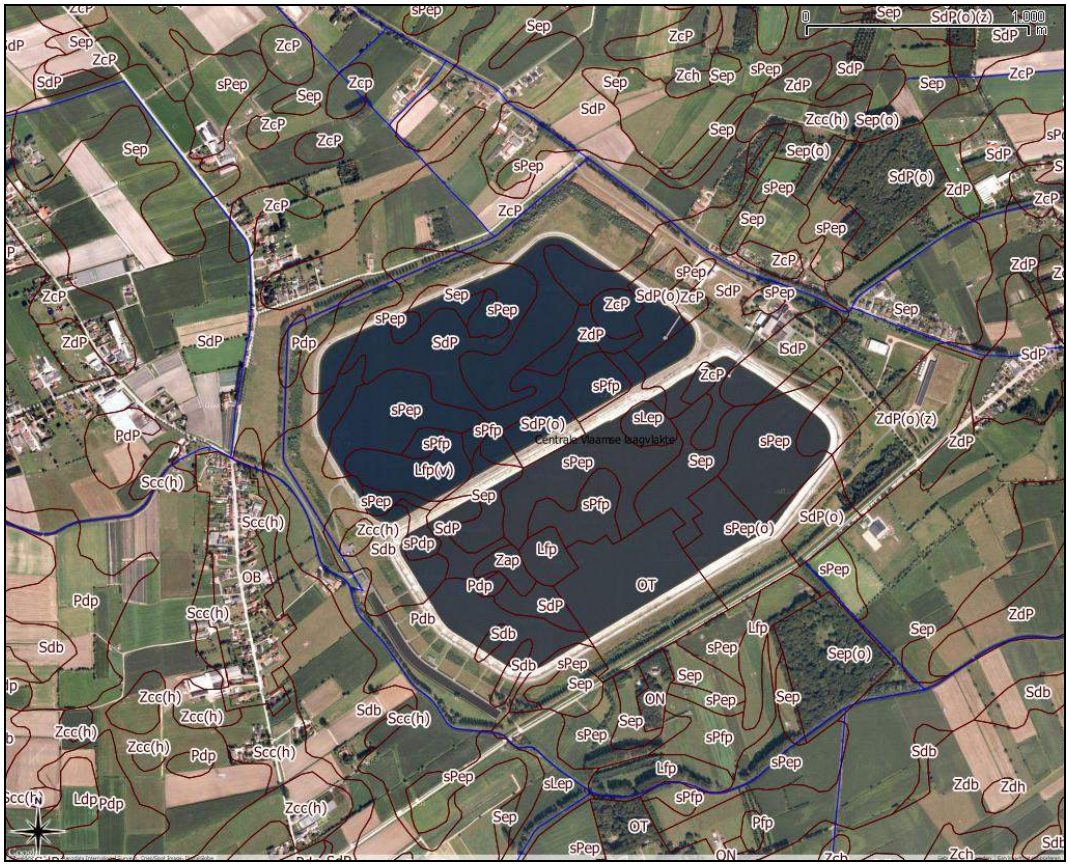

Figure 6.6 - Example of the need for updating the current soil map of the Flemish region; reservoir near Moerbeke (province of Oost-Vlaanderen)

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Annexes

Annex 1 - Definitions of WRB terms[12]

Definitions of used (or relevant) horizons and diagnostic properties

Abrupt textural difference	An abrupt textural difference (from Latin *abruptus*, abrupt) is a very sharp increase in clay content within a limited depth range.
Albic material	Albic material (from Latin *albus*, white) is predominantly light-coloured fine earth, from which organic matter and/or free iron oxides have been removed, or in which the oxides have been segregated to the extent that the colour of the horizon is determined by the colour of the sand and silt particles rather than by coatings on these particles. It generally has a weakly expressed soil structure or lacks structural development altogether.
Albeluvic glossae	The term albeluvic glossae (from Latin *albus*, white, and *eluere*, to wash out, and Greek *glossa*, tongue) is connotative of penetrations of clay- and Fe-depleted material into an *argic* horizon. Albeluvic glossae occur along soil aggregate surfaces forming vertically continuous tongues. In horizontal sections they exhibit a polygonal pattern. They refer to a combination of stronger coloured parts and lighter coloured parts within the same layer. They are a special case of *retic* properties.
Argic horizon	The argic horizon (from Latin *argilla*, white clay) is a subsurface horizon with distinctly higher clay content than the overlying horizon.
Artefacts	Artefacts (from Latin *ars*, art, and *facere*, to make) are solid or liquid substances that are: 1. one or both of the following: a. created or substantially modified by humans as part of an industrial or artisanal manufacturing process; ***or*** b. brought to the surface by human activity from a depth, where they were not influenced by surface processes, and deposited in an environment, where they do not commonly occur, with properties substantially different from the environment where they are placed; ***and*** 2. have substantially the same chemical and mineralogical properties as when first manufactured, modified or excavated.
Calcaric material	Calcaric material (from Latin *calcarius*, containing lime) refers to material that contains ≥ 2% calcium carbonate equivalent. The carbonates are inherited from the parent material.
Cambic horizon	The cambic horizon (from Late Latin *cambiare*, to change) is a subsurface horizon showing evidence of pedogenetic alteration that ranges from weak to relatively strong. The cambic horizon has lost, at least in half of the volume of the fine earth fraction, its original rock structure. If the underlying layer has the same parent material, the cambic horizon usually shows higher oxide and/or clay contents than this underlying layer and/or evidence of removal of carbonates and/or gypsum. The pedogenetic alteration of a cambic horizon can also be established by contrast with one of the overlying mineral horizons that are generally richer in organic matter and therefore have a darker and/or less intense colour. In this case, some soil structure development is needed to prove pedogenetic alteration.
Colluvic material	Colluvic material (from Latin *colluvio*, mixture) is a heterogeneous mixture of material that, by gravitational action, has moved down a slope. It has been transported as a result of erosional wash or soil creep, and the transport may have been accelerated by landuse practices (e.g. deforestation,

[12] Adapted from IUSS Working Group WRB (2014).

	ploughing, downhill tillage, structure degradation). It has been formed in relatively recent times (mostly Holocene). It normally accumulates in slope positions, in depressions or above a barrier on a low-grade slope (natural or human-made, e.g. hedge walls).
Cryic horizon	The cryic horizon (from Greek *kryos*, cold, ice) is a perennially frozen soil horizon in *mineral* or *organic* materials.
Fluvic material	Fluvic material (from Latin *fluvius*, river) refers to fluviatile, marine and lacustrine sediments that receive fresh material or have received it in the past and still show stratification.
Fragic horizon	The fragic horizon (from Latin *frangere*, to break) is a natural non-cemented subsurface horizon with a structure and a porosity pattern such that roots and percolating water penetrate the soil only along interped faces and streaks. The natural character excludes plough pans and surface traffic pans.
Gleyic properties	Soil materials develop gleyic properties (from Russian *gley*, mucky soil mass) if they are saturated with groundwater (or were saturated in the past, if now drained) for a period that allows *reducing conditions* to occur (this may range from a few days in the tropics to a few weeks in other areas). However, there may be gleyic properties in a clayic layer over a sandy layer, even without the influence of groundwater. In some soils with gleyic properties, the *reducing conditions* are caused by upmoving gases such as methane or carbon dioxide.
Histic horizon	The histic horizon (from Greek *histos*, tissue) is a surface horizon, or a subsurface horizon occurring at a shallow depth, that consists of poorly aerated *organic* material.
Hortic horizon	A hortic horizon (from Latin *hortus*, garden) is a mineral surface horizon created by the human activities of deep cultivation, intensive fertilization and/or long-continued application of human and animal wastes and other organic residues (e.g. manures, kitchen refuse, compost and night soil).
Lithic discontinuity	Lithic discontinuities (from Greek *lithos*, stone, and Latin *continuare*, to continue) are significant differences in particle-size distribution or mineralogy that represent differences in parent material within a soil. A lithic discontinuity can also denote an age difference. The different strata may have the same or a different mineralogy.
Mollic horizon	The mollic horizon (from Latin *mollis*, soft) is a thick, dark-coloured surface horizon with a high base saturation and a moderate to high content of organic matter.
Natric horizon	The natric horizon (from Arabic *natroon*, salt) is a dense subsurface horizon with a distinctly higher clay content than in the overlying horizon(s). It has a high content of exchangeable Na and in some cases, a relatively high content of exchangeable Mg.
Organic material	Organic material (from Greek *organon*, tool) consists of a large amount of organic debris that accumulates under either wet or dry conditions and in which the mineral component does not significantly influence the soil properties.
Plaggic horizon	A plaggic horizon (from Low German *plag*, sod) is a black or brown mineral surface horizon that results from human activity. Mostly in nutrient-poor soils in the north- western part of Central Europe from Medieval times until the introduction of mineral fertilizers at the beginning of the 20th century, sod and other topsoil materials were commonly used for bedding livestock. The sods consist of grassy, herbal or dwarfshrub vegetation, its root mats and soil material sticking to them. The mixture of sods and excrements was later spread on fields. The material brought in eventually produced an appreciably thickened horizon (in places > 100 cm thick) that is rich in *soil organic carbon*. Base saturation is typically low.
Pretic horizon	A pretic horizon (from Portuguese preto, black) is a mineral surface horizon

	that results from human activities including the addition of charcoal. It is characterized by its dark colour, the presence of artefacts (ceramic fragments, lithic instruments, bone or shell tools etc.) and high contents of organic carbon, phosphorus, calcium, magnesium and micronutrients (mainly zinc and manganese), usually contrasting with natural soils in the surrounding area. It typically contains visible remnants of charcoal.
Reducing conditions	Reducing conditions (from Latin *reducere*, to draw back) show one or more of the following: 1. a negative logarithm of the hydrogen partial pressure (rH, calculated as Eh·29-1 + 2·pH) of < 20; ***or*** 2. the presence of free Fe2+, as shown on a freshly broken and smoothed surface of a field-wet soil by the appearance of a strong red colour after wetting it with a 0.2percent α,α-dipyridyl solution in 10percent acetic acid; ***or*** 3. the presence of iron sulfide; ***or*** 4. the presence of methane.
Retic properties	Retic properties (from Latin *rete*, net) describe the interfingering of coarser-textured *albic* material into a finer-textured *argic* or *natric* horizon. The interfingering coarsertextured *albic* material is characterized by a partial removal of clay and free iron oxides. There may be also coarser-textured *albic* material falling from the overlying horizon into cracks in the *argic* or *natric* horizon. The interfingering coarser-textured *albic* material is found as vertical and horizontal whitish intercalations on the faces and edges of soil aggregates.
Soil organic carbon	Soil organic carbon is organic carbon that does not meet the diagnostic criteria of *artefacts*.
Salic horizon	The salic horizon (from Latin *sal*, salt) is a surface horizon or a subsurface horizon at a shallow depth that contains high amounts of readily soluble salts, i.e. salts more soluble than gypsum (CaSO4·2H2O; log Ks = -4.85 at 25 ℃).
Spodic horizon	The spodic horizon (from Greek *spodos*, wood ash) is a subsurface horizon that contains illuvial substances composed of organic matter and Al, or of illuvial Fe. The illuvial materials are characterized by a high pH-dependent charge, a relatively large surface area and high water retention.
Stagnic properties	Soil materials develop stagnic properties (from Latin *stagnare*, to stagnate) if they are, at least temporarily, saturated with surface water (or were saturated in the past, if now drained) for a period long enough that allows *reducing conditions* to occur (this may range from a few days in the tropics to a few weeks in other areas). In some soils with stagnic properties, the *reducing conditions* are caused by the intrusion of other liquids such as gasoline.
Terric horizon	A terric horizon (from Latin *terra*, earth) is a mineral surface horizon that develops through addition of, for example, earthy manures, compost, beach sands, loess or mud. It may contain stones, randomly sorted and distributed. In most cases it is built up gradually over a long period of time. Occasionally, terric horizons are created by single additions of material. Normally the added material is mixed with the original topsoil.
Umbric horizon	The umbric horizon (from Latin *umbra*, shade) is a thick, dark-coloured surface horizon with a low base saturation and a moderate to high content of organic matter.

Definitions of used (or relevant) qualifiers

Abruptic (ap)	having an *abrupt textural difference* within ≤ 100 cm of the mineral soil surface. *Used for soil type where substratum has a marked finer texture than the texture of the suface soil e.g.* **wS**.. **uL.**.*, are pronounced*
Albic (ab)	having a layer of *albic* material ≥ 1 cm thick, and starting ≤ 100 cm from the mineral soil surface, that does not consist of *tephric* material, does not contain carbonates, and does not contain gypsum; and that directly overlies a diagnostic horizon or forms part of a layer with *stagnic* properties.
Alic (al)	having an *argic* horizon starting ≤ 100 cm from the soil surface and having a CEC of ≥ 24 cmolc kg-1 clay throughout or to a depth of 50 cm of its upper limit, whichever is thinner; and having a base saturation of < 50% in the major part between 50 and 100 cm from the mineral soil surface *or* in the lower half of the mineral soil above *continuous rock*, *technic hard* material or a cemented or indurated layer starting ≤ 100 cm from the mineral soil surface.
Arenic (ar)	having a texture class of sand or loamy sand in a layer ≥ 30 cm thick, within ≤ 100 cm of the mineral soil surface or between the mineral soil surface and *continuous rock, technic hard* material or a cemented or indurated layer, whichever is shallower.
Brunic (br)	having a layer ≥ 15 cm thick, and starting ≤ 50 cm from the soil surface, that meets diagnostic criteria 2–4 of the *cambic* horizon but fails diagnostic criterion 1, and does not consist of *albic* material.
Calcaric (ca)	having *calcaric* material throughout between 20 and 100 cm from the soil surface, or between 20 cm and *continuous rock, technic hard* material or a cemented or indurated layer, whichever is shallower.
Cambic (cm)	having a *cambic* horizon not consisting of *albic* material and starting ≤50 cm from the soil surface.
Carbic (cb)	having a *spodic* horizon that does not turn redder on ignition throughout (*in Podzols only*).
Clayic (ce)	having a texture class of clay, sandy clay or silty clay, in a layer ≥30 cm thick, within ≤ 100 cm of the mineral soil surface or between the mineral soil surface and *continuous rock, technic hard* material or a cemented or indurated layer, whichever is shallower.
Colluvic (co)	having *colluvic* material, ≥20 cm thick.
Dystric (dy)	having: • in *Histosols*, a pHwater < 5.5 in the major part with *organic* material, within 100 cm of the soil surface, • in other soils, a base saturation of < 50% in the major part between 20 and 100 cm from the mineral soil surface or between 20 cm and continuous rock, technic hard material or a cemented or indurated layer, whichever is shallower, or in a layer ≥ 5 cm thick, directly above continuous rock, technic hard material or a cemented or indurated layer, if the continuous rock, the technic hard material or the cemented or indurated layer starts ≤ 25 cm from the mineral soil surface.
Entic (et)	having a loose *spodic* horizon and not having a layer with *albic* material (*in Podzols only*).
Escalic (ec)	occurring in human-made terraces.
Eutric (eu)	having: • in *Histosols*, a pHwater ≥ 5.5 in the major part with *organic* material within 100 cm of the soil surface, • in other soils, a base saturation, ≥ 50% in the major part between 20 and 100 cm from the mineral soil surface or between 20 cm and *continuous*

	rock, technic hard material or a cemented or indurated layer, whichever is shallower, or in a layer ≧5 cm thick, directly above *continuous rock*, *technic hard* material or a cemented or indurated layer, if the *continuous rock*, the *technic hard* material or the cemented or indurated layer starts ≤ 25 cm from the mineral soil surface.
Fluvic (fv)	having *fluvic* material ≥ 25 cm thick, and starting ≤ 75 cm from the mineral soil surface. *Used for soil types in alluvial valleys and soils of the polders*
Fragic (fc)	having a *fragic* horizon starting ≤ 100 cm from the soil surface. *Used for soil types "***.A.c.***"*
Gleyic (gl)	having a layer ≥ 25 cm thick, and starting ≤ 75 cm from the mineral soil surface, that has *gleyic* properties throughout and *reducing conditions* in in some parts of every sublayer.
Glossic (gs)	having *albeluvic glossae* starting ≤ 100 cm from the soil surface.
Haplic (ha)	having a typical expression of certain features (typical in the sense that there is no further or meaningful characterization) and only used if none of the preceding qualifiers applies.
Histic (hi)	having a *histic* horizon starting at the soil surface.
Hypereutric (je)	having: • in *Histosols*, a pHwater ≧5.5 throughout in the *organic* material within 100 cm of the soil surface and ≧6.5 in some layer with *organic* material within ≥ 100 cm of the soil surface, • in other soils, a base saturation, of ≥ 50% throughout between 20 and 100 cm from the mineral soil surface and ≥ 80% in some layer between 20 and 100 cm from the mineral soil surface.
Leptic (le)	having *continuous rock* or *technic hard* material starting ≤ 100 cm from the soil surface.
Loamic (lo)	having a texture class of loam, sandy loam, sandy clay loam, clay loam or silty clay loam in a layer ≥ 30 cm thick, within ≤ 100 cm of the mineral soil surface or between the mineral soil surface and *continuous rock, technic hard* material or a cemented or indurated layer, whichever is shallower.
Luvic (lv)	having an *argic* horizon starting ≤ 100 cm from the soil surface and having a CEC of ≥ 24 cmolc kg-1 clay throughout or to a depth of 50 cm of its upper limit, whichever is thinner; and having a base saturation, of ≥ 50% in the major part between 50 and 100 cm from the mineral soil surface *or* in the lower half of the mineral soil above *continuous rock*, *technic hard* material or a cemented or indurated layer starting ≤ 100 cm from the mineral soil surface.
Mollic (mo)	having a *mollic* horizon.
Neocambic (nc)	having a *cambic* horizon, not consisting of *albic* material, starting ≥ 50 cm from the soil surface and overlying: • *albic* material that overlies an *argic*, a *natric* or a *spodic* horizon, *or* • a layer with *retic* properties.
Novic (nv)	having a layer, ≥ 5 cm and < 50 cm thick, overlying a buried soil that is classified with preference according to the 'Rules for classifying soils'
Nudiargic (ng)	having an *argic* horizon starting at the mineral soil surface.
Ortsteinic (os)	having a *spodic* horizon that has a subhorizon, ≥ 2.5 cm thick, that is cemented (*ortstein*) in ≥ 50% of its horizontal extension (*in Podzols only*).
Oxygleyic (oy)	not having, within ≤ 100 cm of the mineral soil surface, a layer that meets diagnostic criterion 1 of the *gleyic* properties (*in Gleysols only*).
Plaggic (pa)	having a *plaggic* horizon.
Protic (pr)	showing no soil horizon development, with the exception of a *cryic* horizon, which may be present.
Reductigleyic (ry)	not having, ≥ 40 cm from the mineral soil surface, a layer that meets diagnostic criterion 2 of the *gleyic* properties (*in Gleysols only*).

Relocatic (rc)	being in situ remodelled by human activity to a depth of ≥ 100 cm (e.g. by deep ploughing, refilling soil pits or levelling land) and no horizon development after remodelling at least between 20 cm and 100 cm from the soil surface, throughout (in *Technosols*, *Relocatic* is redundant, except in combination with the *Ekranic* or *Linic* qualifier); a destroyed diagnostic subsurface horizon may be added with a hyphen, e.g. *Spodi-Relocatic* *Used as a morphologic supplementary qualifier for soils with variant* **...(o)**
Retic (rt)	having *retic* properties starting ≤ 100 cm from the soil surface, but not having *albeluvic glossae*.
Rheic (rh)	having a *histic* horizon saturated predominantly with groundwater or flowing surface water (*in Histosols only*).
Ruptic (rp)	having a *lithic discontinuity* at some depth ≤ 100 cm from the soil surface.
Rustic (rs)	having a *spodic* horizon in which the ratio of the percentage of Feox to the percentage of *soil organic carbon* is ≥ 6 throughout (*in Podzols only*).
Salic (sz)	having a *salic* horizon starting ≤ 100 cm from the soil surface *Used for soil types* **r.Pn**, **rEn**
Sapric (sa)	having, after rubbing, less than one-sixth (by volume) of the *organic* material consisting of recognizable plant tissue within 100 cm of the soil surface (*in Histosols only*).
Siltic (sl)	having a texture class of silt or silt loam in a layer ≥ 30 cm thick, within ≤ 100 cm of the mineral soil surface or between the mineral soil surface and *continuous rock, technic hard* material or a cemented or indurated layer, whichever is shallower.
Skeletic (sk)	having ≥ 40% (by volume) coarse fragments averaged over a depth of 100 cm from the soil surface or to *continuous rock, technic hard* material or a cemented or indurated layer, whichever is shallower.
Spodic (sd)	having a *spodic* horizon starting ≤ 200 cm from the mineral soil surface.
Stagnic (st)	having a layer ≥ 25 cm thick, and starting ≤ 75 cm from the mineral soil surface, that does not form part of a *hydragric* horizon and that has: • *stagnic* properties in which the area of reductimorphic colours plus the area of oximorphic colours is ≥ 25% of the total area, *and* • *reducing conditions* for some time during the year in the major part of the soil volume that has the reductimorphic colours.
Technic (te)	having ≥ 10% (by volume, weighted average) *artefacts* in the upper 100 cm from the soil surface or to *continuous rock* or a cemented or indurated layer, whichever is shallower; or having a layer ≥ 10 cm thick, and starting ≤ 90 cm from the soil surface, with ≥ 50% (by volume, weighted average) *artefacts*.
Terric (tr)	having a *terric* horizon, *and* • in Anthrosols, not having a *hortic*, *irragric*, *plaggic* or *pretic* horizon with a thickness of ≥50 cm, *and* • in other soils, not having a *hortic*, *irragric*, *plaggic* or *pretic* horizon. *Used for soil types with thick anthropogenic surface layers, of base saturation ≥ 50%, or pH-H_2O ≥ 5.5*
Tidalic (td)	being flooded by tidewater at mean high tide but not covered by water at mean low tide. *Used for soil type OS of the "Zwin" area.*
Transportic (tn)	having at the soil surface a layer ≥ 20 cm thick, or with a thickness of ≥ 50% of the entire soil if *continuous rock, technic hard* material or a cemented or indurated layer is starting ≤40 cm from the soil surface, with soil material that does not meet the criteria of *artefacts*; and that has been moved from a source area outside the immediate vicinity of the soil by intentional human activity, usually with the aid of machinery, and without substantial reworking

	or displacement by natural forces.
Umbric (um)	having an *umbric* horizon.

Depth specifiers

Amphigleyic	the horizon or layer starts < 50 cm of the (mineral) soil surface and has its lower limit > 50 cm of the (mineral) soil surface *This has been used .for soils with drainage class ".f.."*
Bathy-	The **Bathy**- specifier can be used if the criteria relating to a particular qualifier are fulfilled in a layer that: • extends to a greater depth than specified for the qualifier, *and* • takes into account layers at a depth of > 100 cm from the (mineral) soil surface, *and* • does not comprise buried layers (see '2.5 Buried soils', below). *This has been used for soil types with substratum as* **Bathyruptic***,* **Bathyabruptic***, where the symbol was between brackets e.g. (***w)Ldp***; [except for* **(v)***… see below]*
Endo-	The horizon or layer starts between > 50 and ≤100 cm of the (mineral) soil surface. *This has been used only as* **Endogleyic** *and for soils with drainage classes* ".d." or ".e."
Thapto-	If a diagnostic horizon or a layer with a diagnostic property belongs to a buried soil that does not meet the requirements of the related RSG, the **Thapto-** specifier can be used *This has been used for* • **Thaptohistic** *for all soil types indicated having a "histic" substratum* **v…, v-…, (v)…** • **Thaptospodic**

Annex 2. Correlation table of the mapping units of coastal plain with the standardlegend of the soil map of Belgium

conversietabel polderlegende - morfogenetisch classifcatiesysteem (dwz de rest van België)
VLM West-Vlaanderen
info : Carole Ampe, Chris Vynckier
versie 6/8/2010

opmerkingen :
drainage : is enkel een gemiddelde waarde
voor een globale kaart is de omzetting bruikbaar
voor gebruik op perceelsniveau is de omzetting niet bruikbaar, hiervoor is een
update van lokale drainage kan men gebruik maken van een DTM of door terreincontrole
profielontwikkeling : standaard is "p" ingevuld

substraat:
(w) = > 100 cm
w- = 60 - 100 cm
w = < 60 cm

Polder-bodemtype	Drain	Bodemserie	Streek	Sub	Text	Drain	Profiel	Var	tekst
1. Kuststreek									
1.1 Duinen									
1.1.1. Hoge duinen									
A0	a	Zap	DUIN		Z	a	p		de hoge duinen, al of niet gefixeerd
1.1.2. Duingronden									
B1	a	Zap	DUIN		Z	a	p		droge duingrond
B2	c	Zcp	DUIN		Z	c	p		middelmatig vochtige duingrond
B3	d	Zdp	DUIN		Z	d	p		natte duingrond
1.1.3. Geëgaliseerde duingronden									
C1	b	Zbp	DUIN		Z	b	p		droge geëgaliseerde duingrond
C2	c	Zcp	DUIN		Z	c	p		middelmatig vochtige geëgaliseerde duingrond
C3	d	Zdp	DUIN		Z	d	p		natte geëgaliseerde duingrond
1.1.4. Overgangsgronden									
Da	d	uZdp	DUIN	u	Z	d	p		zand, op variërende diepte rustend op polderafzetting
Db	d	uSdp	DUIN	u	S	d	p		slibhoudend zand, op variërende diepte doorgaans rustend op
1.2. Landschap van de Moeren									
1.2.1. Gronden op zandig materiaal									
Sl	c/d	Sc/dp	MOER		S	c/d	p		gronden op zandig materiaal boven normaal ontwateringspeil
uSl	c/d	uSc/dp	MOER	u	S	c/d	p		gronden op zandig materiaal boven normaal ontwateringspeil ; kleisubstraat
Sly	c/d	Sc/dpy	MOER		S	c/d	p	y	gronden op zandig materiaal boven normaal ontwateringspeil ; textuur wordt
Sm	d	Sdp	MOER		S	d	p		gronden op zandig materiaal op normaal ontwateringspeil
uSm	d	uSdp	MOER	u	S	d	p		gronden op zandig materiaal op normaal ontwateringspeil ; kleisubstraat op
Smy	d	Sdpy	MOER		S	d	p	y	gronden op zandig materiaal op normaal ontwateringspeil ; textuur wordt
1.2.2. Gronden op zandlemig materiaal									

Polder-bodemtype	Drain	Bodemserie	Streek	Sub	Text	Drain	Profiel	Var	tekst
Pl	d	Pdp	MOER		P	d	p		gronden op zandlemig materiaal boven normaal ontwateringspeil
sPl	d	sPdp	MOER	s	P	d	p		gronden op zandlemig materiaal boven normaal ontwateringspeil ;
uPl	d	uPdp	MOER	u	P	d	p		gronden op zandlemig materiaal boven normaal ontwateringspeil ;
Pm	d/e	Pd/ep	MOER		P	d/e	p		gronden op zandlemig materiaal op normaal ontwateringspeil
sPm	d/e	sPd/ep	MOER	s	P	d/e	p		gronden op zandlemig materiaal op normaal ontwateringspeil ; zandsubstraat
uPm	d/e	uPd/ep	MOER	u	P	d/e	p		gronden op zandlemig materiaal op normaal ontwateringspeil ; kleisubstraat
Pn	e	Pep	MOER		P	e	p		gronden op zandlemig materiaal aanwezigheid van zoute kwel en voortdurend
1.2.3. Gronden op kleiig materiaal									
El	d	Edp	MOER		E	d	p		gronden op kleiig materiaal boven normaal ontwateringspeil
sEl	d	sEdp	MOER	s	E	d	p		gronden op kleiig materiaal boven normaal ontwateringspeil ; zandsubstraat
Elz	d	Edpz	MOER		E	d	p	z	gronden op kleiig materiaal boven normaal ontwateringspeil ; textuur wordt
Em	d/e	Ed/ep	MOER		E	d/e	p		gronden op kleiig materiaal op normaal ontwateringspeil
Emz	d/e	Ed/epz	MOER		E	d/e	p	z	gronden op kleiig materiaal op normaal ontwateringspeil ; textuur wordt lichter
En	e	Eep	MOER		E	e	p		gronden op kleiig materiaal aanwezigheid van zoute kwel en voortdurend
1.3. Oud- en Middellandpolders									
1.3.1. Oudlandpolders									
1.3.1.1. Kreekruggronden									
A0	b	Sbp	POLO		S	b	p		slibhoudend zand tot zand, meer dan 100 cm;
A1	b	sLbp	POLO	s	L	b	p		lichte klei tot zavel, op minder dan 60 cm diepte overgaand tot zand
A2	c	s-Lcp	POLO	s-	L	c	p		lichte klei tot zavel, op meer dan 60 cm diepte veelal overgaand tot zand
A3	d	sL/Edp	POLO	s	L/E	d	p		klei, op minder dan 60 cm diepte overgaand tot zand
A4	d	lEdp	POLO	l	E	d	p		zware klei tot klei, op minder dan 60 cm diepte overgaand tot lichter materiaal;
A4l	d	lL/Edp	POLO	l	L/E	d	p		lichte klei, overgaand tot klei die op minder dan 60 cm diepte overgaat tot
A5	d	l-E/Udp	POLO	l-	E/U	d	p		zware klei tot klei, tussen 60 en 100 cm diepte overgaand tot lichter materiaal
A5l	d	l-Edp	POLO	l-	E	d	p		lichte klei, overgaand tot klei die tussen 60 en 100 cm diepte overgaat tot
A6	d/e	(l)U/Ed/ep	POLO	(l)	U/E	d/e	p		zware klei tot klei, op meer dan 100 cm diepte overgaand tot lichter materiaal
Ab1	d/e	l-E/Ld/epy	POLO	l-	E/L	d/e	p	y	klei tot lichte klei, overgaand tot lichter materiaal, dat op minder dan 100 cm
1.3.1.2. Poelgronden									
B1	d/e	(v)E/Ud/ep	POLO	(v)	E/U	d/e	p		zware klei, op meer dan 100 cm diepte rustend op veen
B2	e	v-Uep	POLO	v-	U	e	p		zware klei, tussen 60 en 100 cm diepte rustend op veen
B3	f	vUfp	POLO	v	U	f	p		zware klei, tussen 20 en 60 cm ,diepte rustend op veen
B4	g	Vgp	POLO		V	g	p		venig materiaal, op meer dan 100 cm diepte
1.3.1.3. Kalkarme poelgronden									
Bk1	e	(v)E/Uep	POLO	(v)	E/U	e	p		zware klei (ontkalkt), op meer dan 100 cm diepte rustend op veen
Bk2	e/f	v-Ue/fp	POLO	v-	U	e/f	p		zware klei (ontkalkt), tussen 60 en 100 cm diepte rustend op veen
Bk3	f	vUfp	POLO	v	U	f	p		zware klei (ontkalkt), tussen 20 en 60 cm ,diepte rustend op veen
1.3.1.4. Oude kleiplaatgronden									
C1	d	u-Udp	POLO	u-	U	d	p		zware klei, geelgrijs tot bruingrijs, op meer dan 60 cm diepte rustend op klei
C2	d/e	u-Ud/ep	POLO	u-	U	d/e	p		zware klei, grauwgrijs, op meer dan 60 cm diepte rustend op klei van de
C3	d	l-Udp	POLO	l-	U	d	p		zware klei, grauwgrijs, op minder dan 100 cm diepte rustend op licht materiaal
1.3.1.5. Overdekte waddengronden									

	Polder-bodemtype	Drain	Bodemserie	Streek	Sub	Text	Drain	Profiel	Var	tekst
	W1	d	w-Udp	POLO	w-	U	d	p		zware klei, tussen 60 en 130 cm diepte rustend op Atlantische
	W2	d/e	wEd/ep	POLO	w	E	d/e	p		klei, tussen 20 en 60 cm diepte rustend op Atlantische waddensedimenten
	W2z	d	sEdp	POLO	s	E	d	p		klei, tussen 20 en 60 cm diepte rustend op zandige Atlantische
	W2k	d	sE/Udp	POLO	s	E/U	d	p		klei, tussen 20 en 60 cm diepte rustend op kleiige Atlantische
1.3.1.6. Geulgronden										
	G1	e	l-Uep	POLO	l-	U	e	p		zware klei, op minder dan 100 cm diepte overgaand tot lichter materiaal, in
	G2	e	Uep	POLO		U	e	p		zware klei, meer dan 100 cm, in lage geulen gelegen
	G3	f	Ufp	POLO		U	f	p		heterogeen gereduceerd materiaal, in zeer lage geulen gelegen
1.3.1.7. Gronden van de Lage Moeren										
	M1	e/d	Sep(o)	POLO		S	e/d	p	(o)	afgeveende gronden - Pleistoceen zandig materiaal
	M2	f	l-Vfp(o)	POLO	l-	V	f	p	(o)	afgeveende gronden - venig materiaal rustend op Pleistoceen
	M3	f	(v)E/Ud/ep(o)	POLO	(v)	E/U	d/e	p	(o)	uitgeveende gronden - klei rustend op Pleistoceen, eventueel ervan
1.3.2. Middellandpolders										
1.3.2.1. Overdekte Kreekruggronden										
	D1	b	sLbp	POLM	s	L	b	p		lichte klei tot zavel, op minder dan 60 cm diepte overgaand tot zand
	D2	c	s-Lcp	POLM	s-	L	c	p		lichte klei tot zavel, op meer dan 60 cm diepte veelal overgaand tot zand
	D3	d	sL/Edp	POLM	s	L/E	d	p		klei op minder dan 60 cm diepte overgaand tot zand
	D4	d	lEdp	POLM	l	E	d	p		zware klei tot klei, op minder dan 60 cm diepte overgaand tot lichter materiaal;
	D4l	d	lL/Edp	POLM	l	L/E	d	p		lichte klei tot zavel, tussen 20 en 40 cm diepte rustend op Duinkerken II-klei
	D5	d	l-E/Udp	POLM	l-	E/U	d	p		zware klei tot klei, tussen 60 en 100 cm diepte overgaand tot lichter materiaal
	D5l	d	l-Edp	POLM	l-	E	d	p		lichte klei tot zavel, tussen 20 en 40 cm diepte rustend op Duinkerken II-klei
	Dfl	d/e	l-Ud/epy	POLM	l-	U	d/e	p	y	zware klei, overgaand tot lichter materiaal dat op minder dan 100 cm diepte
	Dk4	d	uEdpz	POLM	u	E	d	p	z	klei, tussen 20 en 40 cm diepte rustend op Duinkerken II-klei die op minder
	Dk5	d	uEdpz	POLM	u	E	d	p	z	klei, tussen 20 en 40 cm diepte rustend op Duinkerken II-klei die tussen 60 en
	Dk6	d	u-Edpz	POLM	u-	E	d	p	z	klei, op meer dan 40 cm diepte rustend op Duinkerken II-klei die op minder
	Dl2	d	lLdpz	POLM	l	L	d	p	z	slibhoudend zand, rustend op zavel of op lichte klei die op meer dan 60 cm
	Dl3	d	uLdpz	POLM	u	L	d	p	z	slibhoudend zand, rustend op klei die op minder dan 60 cm diepe overgaat tot
	Dl4	d	uL/Edpz	POLM	u	L/E	d	p	z	lichte klei tot zavel, tussen 20 en 40 cm diepte rustend op Duinkerken II-klei
	Dl5	d	uL/Edpz	POLM	u	L/E	d	p	z	lichte klei tot zavel, tussen 20 en 40 cm diepte rustend op Duinkerken II-klei
	Dl6	d	u-L/Edpz	POLM	u-	L/E	d	p	z	lichte klei tot zavel, op meer dan 40 cm diepte rustend op Duinkerken II-klei
1.3.2.2. Dekkleigronden										
	E1	d	E/Udp	POLM		E/U	d	p		zware klei tot klei, meer dan 100 cm
	E1l	d	Edp	POLM		E	d	p		lichte klei, op minder dan 100 cm rustend op klei
1.3.2.3. Overdekte poelgronden										
	F1	e	(v)Uep	POLM	(v)	U	e	p		zware klei, tussen 20 en 40 cm diepte rustend op zware Duinkerken II klei
	F2	e	v-Uep	POLM	v-	U	e	p		zware klei, tussen 20 en 40 cm diepte rustend op zware Duinkerken II-klei;
	Fl1	e	uL/Ep	POLM	u	L/E	e	p		lichte klei tot zavel, tussen 20 en 40 cm diepte rustend op zware Duinkerken II
	Fl1d	e	u-L/Eepz	POLM	u-	L/E	e	p	z	lichte klei tot zavel, tussen 20 en 40 cm diepte rustend op zware Duinkerken II
	Fl2	e	v-L/Eepy	POLM	v-	L/E	e	p	y	lichte klei tot zavel, tussen 20 en 40 cm diepte rustend op zware Duinkerken II-
	Fl3	e	uL/Eep	POLM	u	L/E	e	p		lichte klei tot zavel, tussen 40 en 100 cm diepte rustend op zware Duinkerken
	Fl3d	e	uL/Eepz	POLM	u	L/E	e	p	z	lichte klei tot zavel, tussen 40 en 100 cm diepte rustend op zware Duinkerken
	Fl4	e	v-L/Eepy	POLM	v-	L/E	e	p	y	lichte klei tot zavel, tussen 40 en 100 cm diepte rustend op zware Duinkerken
	Fk1	e	uEep	POLM	u	E	e	p		klei, tussen 20 en 40 cm diepte rustend op zware Duinkerken II-klei

Polder-bodemtype	Drain	Bodemserie	Streek	Sub	Text	Drain	Profiel	Var	tekst
Fk1d	e	uEepz	POLM	u	E	e	p	z	klei, tussen 20 en 40 cm diepte rustend op zware Duinkerken II-klei; licht
Fk2	e	v-Eep	POLM	v-	E	e	p		klei, tussen 20 en 40 cm diepte rustend op zware Duinkerken II-klei; veen op
Fk3	e	u-Eep	POLM	u-	E	e	p		klei, tussen 40 en 100 cm diepte rustend op zware Duinkerken II-klei
Fk3d	e	u-Eepz	POLM	u-	E	e	p	z	klei, tussen 40 en 100 cm diepte rustend op zware Duinkerken II-klei; licht
Fk4	e	v-Eepy	POLM	v-	E	e	p	y	klei, tussen 40 en 100 cm diepte rustend op zware Duinkerken II-klei, veen op
Fc1	f	Ufp	POLM		U	f	p		zware ontkalkte klei, op minder dan 100 cm diepte rustend op zware
Fc2	f	v-Ufp	POLM	v-	U	f	p		zware ontkalkte klei, rustend op zware poelgrondklei die zelf tussen 60 en 100
Fc3	f	v-Ufp	POLM	v-	U	f	p		zware ontkalkte klei, rustend op zware poelgrondklei die zelf tussen 20 en 60
1.3.2.4. Geulgronden									
G1	e	l-Uep	POLM	l-	U	e	p		zware klei, op minder dan 100 cm diepte overgaand tot lichter materiaal, in
G2	e	Uep	POLM		U	e	p		zware klei, meer dan 100 cm, in lage geulen gelegen
G3	f	Ufp	POLM		U	f	p		heterogeen gereduceerd materiaal, in zeer lage geulen gelegen
1.4. Nieuwlandpolders									
1.4.1. Het Ijzerestuarium									
1.4.1.1. Strandruggronden									
A1	b	Zbp	POLN		Z	b	p		zand, meer dan 100 cm; droog profiel
A1h	b	(s)Zbp	POLN	(s)	Z	b	p		zand, meer dan 100 cm; vochtig profiel
A2	b	Sbp	POLN		S	b	p		slibhoudend zand, meer dan 100 cm
A2k	b	u-Sbp	POLN	u-	S	b	p		slibhoudend zand, tussen 60 en 100 cm diepte overgaand tot klei
A2z	b	s-Sbp	POLN	s-	S	b	p		slibhoudend zand, tussen 60 en 100 cm diepte overgaand tot zand
1.4.1.2. Schorgronden									
B1	d	lE/Udp	POLN	l	E/U	d	p		klei, op minder dan 60 cm diepte overgaand tot lichter materiaal
B2	d	l-E/Udp	POLN	l-	E/U	d	p		klei, tussen 60 en 100 cm diepte overgaand tot lichter materiaal
B3	d	(l)E/Udp	POLN	(l)	E/U	d	p		klei, meer dan 100 cm
1.4.2. Historische Polders van Oostende									
1.4.2.1. Kleiplaatgronden									
K1	d/e	uE/Ud/ep	HPL	u	U	d/e	p		zware bruine klei, op minder dan 60 cm diepte rustend op een storende laag
K1l	d	uE/Udpz	HPL	u	U	d	p	z	zware bruine klei, op minder dan 60 cm diepte rustend op kleiige oude
K1a	d	uUdp	HPL	u	U	d	p		zware bruine klei, op minder dan 60 cm diepte rustend op kleiige oudere
K2	d/e	u-E/Ud/ep	HPL	u-	U	d/e	p		zware bruine klei, tussen 60 en 100 cm diepte rustend op een storende laag
K2a	d	u-Udp	HPL	u-	U	d	p		zware bruine klei, tussen 60 en 100 cm diepte rustend op kleiige oudere
K3	d	E/Udp	HPL		U	d	p		zware bruine klei, meer dan 100 cm
K3z	d	E/Udpz	HPL		U	d	p	z	zware bruine klei, op minder dan 60 cm diepte overgaand tot zand
1.4.2.2. Geulgronden									
G1	e	l-Uep	HPL	l-	U	e	p		zware klei, op minder dan 100 cm diepte overgaand tot lichter materiaal, in
G1z	e	Sep	HPL		S	e	p		zandig materiaal, meer dan 100 cm, in lage geulen gelegen
G2	e	Uep	HPL		U	e	p		zware klei, meer dan 100 cm, in lage geulen gelegen
G3	f	Ufp	HPL		U	f	p		heterogeen gereduceerd materiaal, in zeer lage geulen gelegen
1.4.3. Zwin									
1.4.3.1. Lichte schorgronden									
Ba	d	Edp	POLNZ		E	d	p		lichte schorgronden (kleidek bestaande uit lichte klei)

Polder-bodemtype	Drain	Bodemserie	Streek	Sub	Text	Drain	Profiel	Var	tekst
1.4.3.2. Zware schorgronden									
Bb1	d	lE/Udp	POLNZ	l	E/U	d	p		zware klei tot klei, op minder dan 60 cm diepte overgaand tot lichter materiaal
Bb1k	d	lE/Udpy	POLNZ	l	E/U	d	p	y	zware klei tot klei, op minder dan 60 cm diepte overgaand tot lichter materiaal
Bb2	d	l-E/Udp	POLNZ	l-	E/U	d	p		zware klei tot klei, tussen 60 en 100 cm diepte overgaand tot lichter materiaal
Bb2k	d	l-E/Udpy	POLNZ	l-	E/U	d	p	y	zware klei tot klei, tussen 60 en 100 cm diepte overgaand tot lichter materiaal
Bb3	d/e	(l)E/Ud/ep	POLNZ	(l)	E/U	d/e	p		zware klei tot klei, meer dan 100 cm
Bb3k	d/e	(l)E/Ud/epy	POLNZ	(l)	E/U	d/e	p		zware klei tot klei, op minder dan 100 cm diepte rustend op een oudere
1.4.3.3. Zeer zware schorgronden									
Bc0	d/e	sUd/ep	POLNZ	s	U	d/e	p		zeer zware klei, op minder dan 60 cm diepte overgaand tot zand
Bc1	d/e	lUd/ep	POLNZ	l	U	d/e	p		zeer zware klei, op minder dan 60 cm diepte overgaand tot lichter materiaal;
Bc1k	d/e	lUd/epy	POLNZ	l	U	d/e	p	y	zeer zware klei op minder dan 60 cm diepte overgaand tot lichter materiaal
Bc2	d/e	l-Ud/ep	POLNZ	l-	U	d/e	p		zeer zware klei, tussen 60 en 100 cm diepte overgaand tot lichter materiaal
Bc3	d/e	(u)Ud/ep	POLNZ	(u)	U	d/e	p		zeer zware klei, veelal overgaand tot klei
1.4.3.4. Kreekwalgronden									
H1		s-L/Edp	POLNZ	s-	L/E	d	p		lichte klei tot zavel, op minder dan 100 cm diepte veelal overgaand tot zand
H2		u-L/Edp	POLNZ	u-	L/E	d	p		lichte klei tot zavel, op minder dan 100 cm diepte rustend op klei
1.4.3.5. Lichte gronden met storende laag									
Lk2	e	uL/Eep	POLNZ	u	L/E	e	p		lichte klei tot zavel, tussen 20 en 40 cm diepte rustend op klei
Lk4	e	u-L/Eep	POLNZ	u-	L/E	e	p		lichte klei tot zavel, op meer dan 40 cm diepte rustend op klei
Lk4v	e	(v)L/Eepy	POLNZ	(v)	L/E	e	p	y	lichte klei tot zavel, op meer dan 40 cm diepte rustend op klei; veen op meer
1.4.3.6. Lichte gronden met storende laag									
Kv	e	(v)Eepy	POLNZ	(v)	E	e	p	y	klei overgaand tot zware klei, op meer dan 100 cm diepte rustend op veen
1.5. Overgangsgronden naar de Zandstreek of Zandleemstreek									
1.5.1. Overdekt-pleistocene gronden									
P1	d	lPdp		l	P	d	p		gebroken zand, tussen 20 en 50 cm diepte rustend op Pleistoceen
P2	d	l-Pdp		l-	P	d	p		gebroken zand, tussen 60 en 100 cm diepte rustend op Pleistoceen
P3	d	lL/Edp		l	L/E	d	p		gebroken klei, tussen 20 en 60 cm diepte rustend op Pleistoceen
P4	d	l-L/Edp		l-	L/E	d	p		gebroken klei, tussen 60 en 100 cm diepte rustend op Pleistoceen
P5	d	lUdp		l	U	d	p		zware klei, tussen 20 en 60 cm diepte, rustend op Pleistoceen
P6	d/e	l-Ud/ep		l-	U	d/e	p		zware klei, tussen 60 en 100 cm diepte, rustend op Pleistoceen
P7	d/e	uL/Ed/epz		u	L/E	d/e	p	z	zavel, tussen 20 en 40 cm diepte overgaand tot lichte klei, die meestal op
Pb1	d/e	v-Ud/epz		v-	U	d/e	p	z	zware klei, op meer dan 100 cm diepte, rustend op Pleistoceen
Pb2	e	vUepz		v	U	e	p	z	zware klei, tussen 60 en 100 cm diepte, rustend op veen, maar Pleistoceen
Pb3	f	vUfpz		v	U	f	p	z	zware klei, tussen 20 en 60 cm diepte, rustend op veen, maar Pleistoceen op
Pk2	d/e	uEd/epz		u	E	d/e	p	z	klei, tussen 20 en 40 cm diepte rustend op zware Duinkerken II-klei die
Pk4	d/e	u-Ed/epz		u-	E	d/e	p	z	klei, tussen 40 en 100 cm diepte rustend op zware Duinkerken II-klei die op
Pl1	d/e	uL/Ed/epz		u	L/E	d/e	p	z	lichte klei tot zavel, tussen 20 en 40 cm diepte, rustend op zware Duinkerken
Pl2	d/e	u-L/Ed/epz		u	L/E	d/e	p	z	lichte klei tot zavel, tussen 20 en 40 cm diepte, rustend op zware Duinkerken
Pl4	d/e	u-L/Ed/epz		u-	L/E	d/e	p	z	lichte klei tot zavel, tussen 40 en 100 cm diepte, rustend op zware Duinkerken
P6l	d/e	l-Ed/ep		l	E/L	d/e	p	z	lichte klei, overgaand tot zware klei die op minder dan 100 cm diepte rust op
P6k	d/e	uEd/ep		u	E	d/e	p	z	klei, overgaand tot zware klei die op minder dan 100 cm diepte rust op

	Polder-bodemtype	Drain	Bodemserie	Streek	Sub	Text	Drain	Profiel	Var	tekst
1.5.2. Overdekt tertiaire gronden										
	T3	d/e	uL/Ed/ep		u	L/E	d/e	p		gebroken klei, tussen 20 en 60 cm diepte rustend op Tertiaire klei
	T4	d/e	u-L/Ed/ep		u-	L/E	d/e	p		gebroken klei, op meer dan 60 cm diepte rustend op Tertiaire klei
	T6	e	u-Uep		u-	U	e	p		zware klei, tussen 60 en 70 cm diepte rustend op Tertiaire klei
	Tb2	e	v-Uepy		v-	U	e	p	y	zware klei, tussen 60 en 100 cm diepte rustend op veen, maar Tertiaire klei
1.5.3. Randgronden										
	Rz2	d/e	uPd/epz		u	P	d/e	p	z	gebroken zand, rustend op polderklei, die soms op minder dan 100 cm diepte
1.6. Kunstmatige gronden										
	OO	d	L/Edpz			L/E	d	p	z	overslaggronden
	OO1	d	Pdpz			P	d	p	z	slibhoudend zand op minder dan 100 cm, in de diepte overgaand tot zand
	OO2	d	L/Edpz			L/E	d	p	z	lichte klei tot zavel, op minder dan 100 cm, in de diepte overgaand tot zand
	OO3	d	u-L/Edpz		u-	L/E	d	p	z	lichte klei tot zavel, tussen 40 en 100 cm, in de diepte rustend op klei die
	OO4	d	uL/Edpz		u	L/E	d	p	z	lichte klei tot zavel, tussen 20 en 40 cm, in de diepte rustend op klei die veelal
	OL	d/e	Ed/ep			E	d/e	p		doorbraak geulgronden
	OE1	d	Edp			E	d	p		dekkleigronden in Oudland, licht profiel
	OE2	e	Udp			U	e	p		dekkleigronden in Oudland, zwaar profiel
	OU1	e	Eepv			E	e	p	v	uitgeveende gronden, licht profiel
	OU2	e/f	Ue/fpv			U	e/f	p	v	uitgeveende gronden, zwaar profiel
	OG1	e	L/Eep			L/E	e	p		uitgebrikte gronden, licht profiel
	OG2	e/f	Ue/fp			U	e/f	p		uitgebrikte gronden, zwaar profiel
	OZ	d/e	Ed/eps			E	d/e	p	s	uitgezande gronden
	OA	d/e	Ed/ep			E	d/e	p		afgegraven gronden
	ON	d	Edp			E	d	p		opgehoogde gronden
	OT	d	Edp(o)			E	d	p	(o)	sterk vergraven gronden
	OD	d	Edp(o)			E	d	p	(o)	verdwenen dijken
	OC	d	Edp(o)			E	d	p	(o)	verdwenen bewoningen

Annex 3 - Classification of 540 legacy soil profiles according to WRB-2007;

Key tot the content of the database fields

ID_PROF	Number of the soil profile as used in the original booklets and in the AARDEWERK databases
AW-93	Soil type as recorded in AARDEWERK-93
SERIE_txt	Soil type as reported in the original booklet
BSC_Map	Soil type as indicated on the digital soil map
RSG-WRB	Reference Soil Group, following the 2nd edition of WRB (IUSS Working Group WRB, 2007)
PreQual	Prefix qualifiers, following the 2nd edition of WRB (IUSS Working Group WRB, 2007)
SufQual	Suffix qualifiers, following the 2nd edition of WRB (IUSS Working Group WRB, 2007)

Nr	ID_PROF	AW-93	SERIE_txt	BSC_Map	RSG-2007	PreQual	SufQual
1	103E01	Aba1	A1b	SAF	Luvisol	Cutanic	Hypereutric, Nudiargic, Siltic
2	103E02	Aca1	Aflb	Aba1	Luvisol	Cutanic	Hypereutric, Nudiargic, Siltic
3	103E03	Aba(b)1	Aflb	Abp(c)	Luvisol	Cutanic	Hypereutric, Siltic
4	103E04	Aca1	Aflb	Aba1	Luvisol	Cutanic	Hypereutric, Siltic
5	103E05	sLbp2	LLZ	sLbc	Regosol	Haplic	Eutric, Endoarenic, Siltic, *Ruptic
6	103E06	Aba1	A1b	Aba(b)1	Luvisol	Cutanic	Hypereutric, Nudiargic, Siltic
7	103E07	Lba1	LLL2b	NC	Luvisol	Cutanic	Hypereutric, Nudiargic, *Bathyarenic*, Siltic
8	103E08	Lca1	LLL2b	Lbp0_1	Luvisol	Cutanic	Endoruptic, Hypereutric, Nudiargic, Siltic
9	103E09	Aba1	A1a	Abp(c)	Luvisol	Cutanic	Hypereutric, Nudiargic, Siltic
10	103E10	Aba1	A1b	Adp0_1	Luvisol	Cutanic	Hypereutric, Nudiargic, Siltic
11	103E11	Aba1	A1b	Aba1	Luvisol	Cutanic	Hypereutric, Nudiargic, Siltic
12	103E12	SbfcC	CT1	sLbc	Regosol	Haplic	Dystric/Eutric?, Arenic
13	103E13	Edp0	T2	AbB	Regosol	Stagnic	Eutric, Ruptic
14	103E14	Zbg	T1p	Aba0(b)	Podzol	Placic	*Arenic
15	103E15	Sbgz	T1p	sLbc	Regosol	Haplic	Brunic, Humic, Endoarenic, *Ruptic
16	103E16	Zbx	T1	sLbc2_3	Arenosol	Haplic	Eutric
17	103E17	Zbg	T1	Aba1	Podzol	Entic	*Arenic
18	103E18	Zbg	T1p	Lbp0_1	Podzol	Albic	*Arenic
19	103E19	Zbg	T1	Abp0_1	Podzol	Albic	*Arenic
20	103E20	Zbx	T1	Abp0_1	Arenosol	Brunic Lamellic	Eutric
21	103E21	Zbf	T1p	SAF	Regosol	Haplic	Brunic, Dystric, Arenic
22	103E22	Aba(b)1	Afo	Aba(b)1	Luvisol	Cutanic	Hypereutric, Siltic
23	103E23	(s)Aba(b)1	Bfoa	ADc0	Luvisol	Cutanic Fragic	Humic, Ruptic, Dystric, Episiltic
24	103E24	sAca(b)2	Afoas	sLbc	Luvisol	Cutanic	Humic, Ruptic, Epidystric, Siltic
25	103E25	Lcc0	Bfoa	Lbc0	Albeluvisol	Cutanic Fragic	Bathyruptic, Dystric, Siltic
26	103E26	Aba(b)1	Afla	Lbp0_1	Luvisol	Cutanic	Hypereutric, Nudiargic, Siltic
27	103E27	Aba1	A1a	Abp(c)	Luvisol	Cutanic	Hypereutric, Nudiargic, Siltic
28	103E28	Aca(b)1	Afla	Aba1	Luvisol	Cutanic	Hypereutric, Nudiargic, Siltic
29	103E29	Aba1	A1b	Aba1	Luvisol	Cutanic	Hypereutric, Nudiargic, Siltic, *Bathycalcaric*
30	103E30	Aba1	A1b	Aba(b)0	Luvisol	Cutanic	Hypereutric, Nudiargic, Siltic,

Nr	ID_PROF	AW-93	SERIE_txt	BSC_Map	RSG-2007	PreQual	SufQual
							Bathycalcaric
31	103E31	Lbpy0	C1	Abp0_1	Cambisol	Haplic	Humic, Hypereutric, Siltic
32	103E32	Abp0	C21	Abp(c)	Luvisol	Haplic	Hypereutric, Siltic, *Colluvic
33	103E33	Lbp0	C31	EDx	Luvisol	Haplic	Hypereutric, Siltic
34	103E34	Lbp0	C1	Lbp0_1	Cambisol	Haplic	Hypereutric, Siltic
35	103E35	AbB1	A2	Abp0_1	Luvisol	Haplic/Cutanic	Hypereutric, Nudiargic, Siltic
36	103E36	Aep0	AL	AIp(1)	Fluvisol	Mollic Endogleyic	Humic, Hypereutric, Siltic, *Ruptic
37	103E37	Lfp0	AL	EFp(1)	Fluvisol	Mollic Endogleyic	Humic, Hypereutric, Siltic, *Epiruptic
38	103E38	Abp0	C1	Abp0_1	Cambisol	Haplic	Colluvic, Hypereutric, Siltic
39	103E39	Lba1	B1	NC	Luvisol	Haplic	Hypereutric, Nudiargic, Siltic, *Bathyruptic
40	103E40	sLcc2	Boa	Abc0	Albeluvisol	Cutanic	Bathyruptic, Dystric, *Loamic
41	103E41	Lcc0	Boa	ADc0	Albeluvisol	Cutanic	Humic, Epidystric, Siltic
42	103E42	sLdc2	LLZ	Lbp0_1	Luvisol	Endogleyic	Ruptic, Hypereutric, Nudiargic, Siltic
43	103E43	Lba1	LLL 1b	OB	Luvisol	Cutanic	Bathyruptic, Siltic
44	103E44	sLcc2	LLZ	OB	Albeluvisol	Cutanic Fragic	Bathyruptic, Dystric, *Loamic, *Humic
45	103E46	Abp(c)	C31	Aba1	Luvisol	Cutanic	Hypereutric, Siltic, *Colluvic
46	102E49	Aba0	A1b	Aba1	Luvisol	Cutanic	Hypereutric, Siltic
47	103E51	Zbg	T1	ZAF	Podzol	Placic	*Arenic
48	103E58	Eep0	AI	AIp(1)	Fluvisol	Endogleyic Mollic	Eutric, Siltic
49	103E61	Ahc1	Ag2	Adp0_1	Cambisol	Haplic	Colluvic, Hypereutric, Siltic
50	103E68	Zbf	T1	SAF	Arenosol	Brunic	Dystric
51	103E76	Zbg	T1p	SAF	Podzol	Albic Ortsteinic	*Arenic
52	103E77	Zbg	T1p	SAF	Podzol	Placic	*Arenic
53	103W01	Aba(b)1	Aba(b)0	Abp(c)	Luvisol	Cutanic	Hypereutric, Manganiferric, Siltic
54	103W02	Abp0	Abp	Abp	Regosol	Colluvic	Eutric, Siltic, *Bathyruptic*
55	103W03	Aba1	Aba1	Abp	Luvisol	Cutanic	Hypereutric, Nudiargic, Siltic
56	103W04	Aba1	Aba0	Aba1(b)	Luvisol	Cutanic	Hypereutric,Siltic
57	103W05	Aba(b)1	Aba(b)0	Aba1	Luvisol	Cutanic	Siltic
58	103W06	(s)Aba1	(s)Aba1	Abp(c)	Cambisol	Haplic	Calcaric, Bathyruptic, Siltic, Bathyarenic
59	103W07	Aba1	Aba1	sAba	Luvisol	Cutanic	Hypereutric, Nudiargic, Siltic

Nr	ID_PROF	AW-93	SERIE_txt	BSC_Map	RSG-2007	PreQual	SufQual
60	103W08	Abp0	Abp	Aba1(b)	Regosol	Colluvic	Eutric, Siltic
61	103W09	Aba0	Aba0	Aba1	Luvisol	Cutanic	Hypereutric, Siltic
62	103W10	(s)AbB3	(s)AbB3	S-Z	Luvisol	Cutanic	Bathyruptic, Hypereutric, Nudiargic, Siltic, Bathyarenic
63	103W11	Zbfc	Zbfd	S-Z	Arenosol	Brunic Lamellic	Eutric
64	103W12	Aba1	Aba1	Aba	Luvisol	Cutanic	Hypereutric, Nudiargic,Siltic
65	103W13	Abp0	Abp	Abp	Regosol	Colluvic	Hypereutric, Siltic
66	103W14	AbB3	AbB3	S-Z	Cambisol	Haplic	Bathycalcaric, Hypereutric, Siltic
67	103W15	sPbc2	sPbc2	Aba	Cambisol	Haplic	Eutric, Ruptic, Densic, Endoarenic
68	103W16	wLda2	wLda2	Aba1	Luvisol	Stagnic Cutanic	Ruptic, Hypereutric, Siltic
69	103W17	Sbfc	Sbfd	S-Z	Arenosol	Brunic Lamellic	Dystric
70	103W18	Zbgc	Zbgd	S-Z	Podzol	Aric-Albic	Dystric, Arenic, *Humic*
71	103W19	sLba2	sLba2	A-L	Alisol	Cutanic	Ruptic, Humic, Hyperdystric, Endoarenic, Siltic
72	103W20	Aba1	Aba0	Aba1(b)	Luvisol	Cutanic	Siltic
73	103W21	(w)Lba2	wLba2	S-Z	Luvisol	Cutanic	Ruptic, Hypereutric
74	103W22	Lbp0	Lbp	Lbp	Regosol	Colluvic	Eutric, Siltic
75	103W23	Abp0	Abp	Lbp	Regosol	Colluvic	Hypereutric, Siltic
76	103W24	sLba2	(s)Lba0	Abp	Cambisol	Haplic	Ruptic, Dystric, Siltic
77	103W25	Abp0	Abp	Abp	Regosol	Colluvic	Hypereutric, Siltic
78	103W26	AbB2	AbB2	Aba(o)	Cambisol	Haplic	Eutric, Siltic
79	103W27	wAba2	wAba2	Aba(o)	Luvisol	Cutanic	Ruptic, Nudiargic, Hypereutric, Bathyarenic, Siltic
80	103W28	Lba1	Lba0	Aba1(b)	Luvisol	Cutanic	Hypereutric, Siltic
81	103W29	Ada0	Ada0	Aba(b)1	Luvisol	Stagnic Bathygleyic Cutanic	Hypereutric, Siltic
82	103W30	(x)Lbc0	(s)Lbc0	Aba1	Cambisol	Haplic	Humic, Dystric, Ruptic, Bathyarenic, Siltic
83	103W31	Sbgc	Sbgd	sLba2_3	Podzol	Ortsteinic	Ruptic, *Arenic
84	103W32	Zbgc	Zbgd	Lbp0_1	Podzol	Albic	*Arenic
85	103W33	Aba(b)0	Aba(b)0	Aba	Luvisol	Cutanic	Hypereutric, Siltic
86	103W34	Aib(1)	Aib(1)	ADp(1)	Cambisol	Gleyic Fluvic	Humic, Eutric, Siltic

Nr	ID_PROF	AW-93	SERIE_txt	BSC_Map	RSG-2007	PreQual	SufQual
87	103W35	Lhp0	Lhp(1)	ADp	Fluvisol	Gleyic	Eutric, Siltic
88	103W36	Efp0	Efp	AIp	Cambisol	Endogleyic Fluvic	Humic, Eutric, Siltic, *Abruptic, *Ruptic
89	103W37	Lhp0	Lhp(1)	AIp	Fluvisol	Endogleyic	Humic, Eutric, Siltic
90	103W38	wSbfc2	wSbfd	Aba1(b)	Planosol	Endogleyic	Albic, Endoeutric, Arenic, *Humic
91	103W39	Aep1	Aep	ADp	Fluvisol	Endogleyic Thaptohistic	Humic, Hypereutric, Siltic
92	103W40	Ada1	Ada1	Aba1	Luvisol	Stagnic Cutanic	Hypereutric, Nudiargic, Siltic
93	103W41	Aba1	Aba1	Aba1	Luvisol	Cutanic	Hypereutric, Nudiargic, Siltic
94	103W42	Abp0	Abp	Abp	Regosol	Colluvic	Hypereutric, Siltic
95	103W43	wLba2	wLba2	sLba	Luvisol	Cutanic	Ruptic,Siltic
96	103W44	Aba0	Aba0	Aba(b)1	Luvisol	Cutanic	Hypereutric, Siltic
97	103W45	AbB3	AbB3	AbB	Regosol	Haplic	Calcaric, Siltic
98	103W46	Abp0	Abp	S-Z	Regosol	Colluvic	Calcaric, Siltic
99	103W47	sLbp2	sLbp2	Abp0_1	Regosol	Haplic	Eutric, Endoarenic, *Ruptic
100	103W48	Aba0	Aba0	Lbp(c)	Luvisol	Cutanic	Hypereutric, Siltic
101	103W49	Zbbc	Zbbd	sAAx	Regosol	Haplic	Brunic, Calcaric, Arenic, *Ruptic*
102	103W50	(s)Lda1	(s)Lda0	Abp	Alisol	Stagnic Cutanic	Ruptic, Humic, Hyperdystric, Siltic, Bathyarenic
103	103W51	(s)Pbc1	PbC	Abp	Alisol	Cutanic	Ruptic, Humic, Hyperdystric, Bathyarenic
104	90E68	(w)Lhp1	Mn	Ldp(c)	Phaeozem	Stagnic	Bathyruptic
105	017E12	Zcg	Zcg	ZAg	Podzol	Albic	*Arenic
106	017E13	Zcg	Zcg	Zdg	Podzol	Albic	*Arenic
107	017E05	Zdg	Zdg	Zdg	Podzol	Endogleyic Albic Carbic	*Arenic
108	017E14	lZdg(o)2	lZdg	Zdg	Podzol	Endogleyic	Anthric, Ruptic, *Aric-albic, *Arenic
109	017E08	uZdg2	uZdg	w-Zeg	Podzol	Endogleyic	Ruptic, *Abruptic, *Aric-albic, *Arenic
110	017E02	Zegc	Zeg	Zdg	Podzol	Endogleyic Carbic	Anthric, Aric-albic, *Arenic
111	017E07	(w)Zeg(v)c	(w)Zeg	Zdg	Podzol	Gleyic Carbic	Anthric, Bathyruptic, *Bathyabruptic, *Arenic*
112	017E10	Seg	Segz	Zdg	Arenosol	Bathygleyic Brunic	Eutric, *Humic, *Aric-spodic
113	017E06	wPdg(v)2	wPdg	Peg	Podzol	Stagnic Bathygleyic	Anthric, Ruptic, *Bathyabruptic, *Aric-albic,

Nr	ID_PROF	AW-93	SERIE_txt	BSC_Map	RSG-2007	PreQual	SufQual
114	017E11	Sec	Sec	Sdgy	Regosol	Endogleyic Aric-Spodic	*Endoarenic Humic, Epidystric, Endoarenic, *Novic*
115	017E01	Zdm	Zdm	Zdm	Anthrosol	Endogleyic Plaggic	Eutric, Hyperarenic, *Albic, *Aric-spodic
116	017E03	Zdm	Zdm	Zcm	Anthrosol	Spodic Endogleyic Plaggic	Dystric, Hyperarenic, *Aric-albic
117	017E04	Sdmc	Sdm	Sdmz	Anthrosol	Endogleyic Plaggic	Hypereutric, Arenic, *Albic, *Endoruptic
118	017E15	Sdm	Sdm(m)	Scm	Anthrosol	Stagnic Endogleyic Plaggic	Eutric, Endoarenic, Bathyruptic
119	017E09	vZfp2	vZfp	v-Sep3	Fluvisol	Epigleyic Thaptohistic	Humic, Eutric, Hyperarenic
120	018W07	Zag	Zag	Zbg	Podzol	Albic Placic	Bathylamellic, *Arenic
121	018W12	Zbg(o)	Zbg	ZAg	Podzol	Albic	Bathyruptic, *Arenic
122	018W02	Zcg	Zcg	Zcg	Podzol	Placic	Ruptic, *Aric-albic, *Arenic
123	018W15	Zcg	Zcg	Zdg	Podzol	Carbic	Bathylamellic, *Aric-Albic, *Arenic
124	018W10	Zdg	Zdg	Zcg	Podzol	Carbic Endogleyic	*Aric-albic, *Arenic
125	018W05	Zdg	Zdg	Zdg	Podzol	Endogleyic	*Aric-albic, *Arenic
126	018W06	Zdg	Zdg	Zdg	Podzol	Endogleyic Albic	*Arenic
127	018W13	Zdg(v)	Zdg	Zdg	Arenosol	Bathygleyic	Anthric, *Arenic
128	018W09	Zeg	Zeg	Zdg	Podzol	Endogleyic Carbic	*Aric-albic, *Arenic
129	018W01	Zfg(o)	Zfg	Zcm	Podzol	Endogleyic	Plaggic, *Aric-albic, *Arenic
130	018W04	Zfg	Zfg	Zeg	Podzol	Endogleyic	Plaggic, *Arenic*
131	018W08	wZfg(o)c2	wZfg	Zcg	Gleysol	Spodic Thaptofluvic	Epiabruptic, Humic, Dystric, Arenic, *Endoruptic
132	018W03	Zdg	Zdgt	Zcg	Podzol	Endogleyic Albic Carbic	*Abruptic, *Humic, *Arenic
133	018W11	Zbm	Zbm	Zbm	Anthrosol	Plaggic	Dystric, Arenic, *Humic
134	018W14	Zbb	Zbb3	Zbm	Anthrosol	Plaggic	Dystric, Arenic, *Humic
135	035E03		type D3E	d.A0	Arenosol	Endogleyic Brunic	Calcaric
136	036W59	-	P type	d.A0	Arenosol	Endogleyic Brunic	Hypercalcaric, Humic
137	035E01		type D2E	d.B1	Arenosol	Bathygleyic Brunic	Calcaric
138	035E30	-	type D1E	d.C1	Arenosol	Brunic	Hypereutric

Nr	ID_PROF	AW-93	SERIE_txt	BSC_Map	RSG-2007	PreQual	SufQual
139	050W10	W2	Type (O)W2	d.C2	Regosol	Endogleyic	Brunic, Hypercalcaric, Endoarenic, Drainic, *Abruptic, *Ruptic
140	035E18	sLdp3	type S2K	d.Da	Cambisol	Endogleyic	Hypercalcaric, Ruptic, Abruptic, Epiarenic, Endoclayic
141	022W34	Zep0	Type S2L	d.Da	Arenosol	Endogleyic Protic	Endocalcaric, *Fluvic
142	022W36	Zep0	Type S2Z	d.Da	Arenosol	Endogleyic Protic	Endocalcaric, *Fluvic
143	021W01	uSdp2	Type S2K	d.Da	Planosol	Endogleyic	Hypercalcaric, Ruptic, *Fluvic, *Loamic
144	011E13	Zdp0	S3M	d.Da	Arenosol	Endostagnic	Endocalcaric, *Fluvic
145	011E14	Zdp0	S2M	d.Da	Arenosol	Endostagnic	Endocalcaric, *Fluvic
146	011E10	wZdp2	Type M3M	d.Db	Arenosol	Endostagnic	Endocalcaric, Bathyabruptic
147	011E12	uZdp2	M3zK type	d.Db	Planosol	Haplic	Albic, Endocalcaric, Ruptic, Arenic, *Fluvic
148	011W14	Scpz1	Type Db (oudsymbool M3Z)	d.Db	Cambisol	Endostagnic Fluvic	Endocalcaric, Endoruptic, Endoarenic, *Fluvic
149	036W37	M2Z	M2Z	d.Db	Arenosol	Endostagnic Fluvic	Hypercalcaric, Bathyruptic, *Fluvic
150	036W67	M2K	M2K	d.Db	Planosol	Haplic	Albic, Epicalcaric, Ruptic, Arenic, *Fluvic
151	050E28	Sdpz0	4 ZZ-type	m.A2	Cambisol	Fluvic	Calcaric, Endoarenic
152	050E52	vLgp2	U2 type (nieuw OU1)	m.A2	Gleysol	Thaptohistic Fluvic	Calcaric, Humic, Ruptic, *Loamic
153	050W01	A1	Type (0)A1	m.A2	Fluvisol	Haplic	Hypercalcaric, Endoarenic, Drainic, *Ruptic
154	050E12	sEdp2	4 Kz-type	m.A4	Cambisol	Fluvic	Hypercalcaric, Humic, Bathyarenic, *Abruptic, *Ruptic
155	050E13	sEdp3	4 Kzz-type (A3)	m.A4	Phaeozem	Fluvic	Calcaric, Humic, *Thapto-Arenic, *Ruptic
156	050E15	Lcp0	4 K-type (A4)	m.A4	Cambisol	Endogleyic Fluvic	Calcaric, Bathyarenic
157	050E20	sEhp2	4 KK-type	m.A4	Phaeozem	Endogleyic *Fluvic	Calcaric, Endoarenic
158	050E02	Ehp(v)0	6 H-type	m.A5	Cambisol	Stagnic Fluvic	Humic, Eutric, *Bathyruptic, *Bathy-Thaptohistic
159	050E06	uEdpy3	4 KK-type (A5)	m.A5	Cambisol	Endogleyic Fluvic	Calcaric, Humic
160	050E26	uEhpz3	P1B-type	m.A5	Cambisol	Bathygleyic Fluvic	Humic, Dystric, Abruptic, Ruptic, *Epiloamic, *Endosiltic, *Bathyarenic
161	010E22	A5	Subtype 2/A5 (oud symbool 21/Z)	m.A5	Cambisol	Endogleyic Fluvic	Calcaric, Endoruptic, *Endoarenic

Nr	ID_PROF	AW-93	SERIE_txt	BSC_Map	RSG-2007	PreQual	SufQual
162	010E24	A6	Type A6 (oud symbool 1)	m.A5	Cambisol	Endogleyic Fluvic	Calcaric, Endoruptic, Endoclayic, *Bathyarenic
163	010E25	A5	Type A5 (oud symbool 4 KKz)	m.A5	Cambisol	Endogleyic Fluvic	Calcaric, Endoruptic, *Loamic, Endoarenic
164	011W31	A5	Type A5 (oud symbool 4 KK)	m.A5	Cambisol	Endogleyic Fluvic	Calcaric, Endoruptic, *Loamic, Bathyarenic
165	022E02	A4	Type A4 (oud symbool 4K)	m.A5	Cambisol	Endogleyic Fluvic	Hypercalcaric, Endoruptic, *Loamic, *Endoarenic
166	022E04	A5	Type A5 (oud symbool 4 KK)	m.A5	Cambisol	Endogleyic Fluvic	Endocalcaric, Humic, Endoruptic, *Loamic
167	050E38	A5	Type 4 KKV	m.A5	Cambisol	Endogleyic Fluvic	Humic, Hypereutric, $Clayic, Endosiltic
168	050E42	A4	Type 4K	m.A5	Cambisol	Endogleyic Fluvic	Hypercalcaric, Endoruptic, *Loamic
169	051W04	A5	Type 4 KK	m.A5	Cambisol	Endogleyic Fluvic	Hypercalcaric, Endoruptic, *Epiloamic, *Endosiltic, *Bathyloamic
170	050E45	Ldc1	L2 type (nieuw C3)	Ldc	Cambisol	Endogleyic	Hypereutric, *Loamic
171	051W05	A5	Type P1	m.A5	Cambisol	Endogleyic Fluvic	Calcaric, Endoruptic, *Loamic
172	022W45	C1	Type (O)C1 [l]	m.A5	Cambisol	Endogleyic Fluvic	Hypercalcaric, Clayic, Bathyloamic, Bathyruptic, *Drainic
173	035E09	wUdpz	type 6	m.A6	Cambisol	Endogleyic Fluvic	Hypercalcaric, Humic, Abruptic, Ruptic, Endoclayic
174	035E21	Scpz1	6H type	m.A6	Cambisol	Endogleyic Fluvic	Hypercalcaric, Abruptic, Ruptic, *Epiloamic, *Endosiltic, *Bathyarenic
175	050E56	Ldp0		Lcp	Cambisol	Haplic	Colluvic, Hypereutric
176	050E64	sPhpy2	ZZL3 (nieuw AC2)	Pcm	Anthrosol	Endogleyic Terric	Hypereutric
177	050E36	Uhp(v)0	6-type	m.B1	Umbrisol	Endostagnic Fluvic	Endoeutric, Humic, Siltic, Drainic, *Ruptic
178	011E60	B1	Type (O)B1 (oud symbool 6)	m.B1	Cambisol	Endogleyic Fluvic	Epicalcaric, Humic, Clayic, *Drainic
179	035E04	Eep0	6V	m.B2	Cambisol	Endogleyic Fluvic	Calcaric, Humic, Siltic
180	050E39	vUep	5 KV-type	m.B2	Phaeozem	Endogleyic *Fluvic	Calcaric, Epiclayic, Endosiltic, *Abruptic, *Ruptic, *Humic
181	022E/65	M5	Type M5 (oud symbool OU3)	m.B2	Cambisol	Endogleyic Fluvic	Humic, Ruptic, Clayic, *Thaptohistic, Bathyarenic
182	011E65	B1	Type (O)B1 (oud	m.B2	Cambisol	Endogleyic Fluvic	Humic, Eutric, Siltic, *Drainic

Nr	ID_PROF	AW-93	SERIE_txt	BSC_Map	RSG-2007	PreQual	SufQual
			symbool 6)				
183	011E66	B2	Type (O)B2 (oud symbool 6V)	m.B2	Cambisol	Endogleyic Fluvic	Eutric, Siltic, *Drainic
184	066W68	Bk1	Type (O)Bk1 (oud symbool 7)	m.Bk1	Gleysol	Fluvic	Eutric, Humic, *Drainic
185	066W20	Bk3	Type (O)Bk3 (oud symbool 7V)	m.Bk3	Gleysol	Fluvic Thaptohistic	Eutric, Humic, *Drainic
186	066W63	Bk3	Type (O)Bk3 (oud symbool 7V)	m.Bk3	Gleysol	Fluvic Thaptohistic	Eutric, Humic, *Drainic
187	022W53	C1	Type (O)C1 [l]	m.C1	Cambisol	Endogleyic Fluvic	Endocalcaric, Humic, Clayic, Bathyloamic, Bathyruptic, *Drainic
188	022E26	C2	Type C2 (oud symbool 2)	m.C1	Cambisol	Endogleyic Fluvic	Hypercalcaric, Humic, Clayic, *Drainic
189	022E33	C2	Type C2 (oud symbool 2)	m.C1	Cambisol	Endogleyic Fluvic	Calcaric, Humic, Clayic, *Drainic
190	022E34	C2	Type C2 (oud symbool 1)	m.C1	Cambisol	Endogleyic Fluvic	Hypercalcaric, Humic, Clayic, *Drainic
191	010E07	C1	Type C1 (oud symbool 1)	m.C2	Cambisol	Endogleyic Fluvic	Endocalcaric, Humic, Clayic, *Drainic
192	010E06	C2	Type C2 (oud symbool 2)	m.C2	Cambisol	Endogleyic Fluvic	Calcaric, Humic, Clayic, *Drainic
193	010E16	C3	Type C3 (oud symbool H6)	m.C2	Cambisol	Endogleyic Fluvic	Calcaric, Humic, Clayic, *Drainic
194	010E17	C3	Type C3 (oud symbool 6)	m.C2	Cambisol	Endogleyic Fluvic	Calcaric, Clayic, *Drainic
195	022W18	C3	Type (O)C3 [6D]	m.C2	Cambisol	Endogleyic Fluvic	Endocalcaric, Humic, Clayic, Bathyruptic, *Drainic
196	022W26	C3	Type (O)C3 [6]	m.C2	Cambisol	Endogleyic Fluvic	Endocalcaric, Humic, Clayic, *Drainic
197	022W06	C1	Type (M)C1 (oud symbool S44 Z)	m.D4	Cambisol	Endogleyic Fluvic	Hypercalcaric, Clayic, Endoarenic, Ruptic, *Drainic
198	011E37	D5	Type (M)D5 (A2)	m.D5	Cambisol	Gleyic Fluvic	Hypercalcaric, Clayic, *Loamic, Arenic, *Polyruptic
199	011E38	D5	Type (M)D5 (A2)	m.D5	Cambisol	Gleyic Fluvic	Hypercalcaric, Clayic, *Loamic, Arenic, *Polyruptic

Nr	ID_PROF	AW-93	SERIE_txt	BSC_Map	RSG-2007	PreQual	SufQual
200	050W34	Ldc1	type (O)Ca6	Ldc	Regosol	Endogleyic	Hypereutric, Siltic, *Drainic, *Ruptic
201	058W45	Pdc0	2 S0 SS bgr	Efp	Albeluvisol	Endogleyic	Dystric, *Humic, *Loamic
202	052W01	Pdc0	Type Ch2 (oud S2Sz)	Sdp	Cambisol	Endogleyic	Eutric, *Loamic
203	044E05	wSdc	wSdc(h)		Podzol	Entic Endogleyic	*Humic, *Abruptic
204	059W13	wSdc	wSdc(h)	Sdm	Arenosol	Albic Endogleyic	Dystric, *Humic
205	045W04	Sec	Secy		Podzol	Endogleyic Albic	*Abruptic, *Humic
206	067E12	Pbc0	Pbc0	wPbc	Cambisol	Haplic	Ruptic, Eutric, Bathyarenic, *Loamic
207	067E10	Pbc0	Pbc0	Pcc	Albeluvisol	Haplic	Ruptic, Eutric, *Loamic
208	37W01	Shcz	CS3 (oud CS2Z)	SdF	Alisol	Endogleyic	Ruptic, Humic, Bathyarenic
209	033W12	sVepc2	sVep	V	Histosol	Sapric Rheic	Dystric, *Endofluvic, *Endoarenic
210	007W41	sVgp3	sV	V	Histosol	Sapric Rheic Aric-Spodic	Dystric, *Endoarenic
211	043E07	Scc	Scc(h)z	Sccz	Anthrosol	Endogleyic Terric	Eutric, Arenic
212	069E11	Scc	Scco	Ldc	Anthrosol	Endogleyic Terric	Eutric, Bathyarenic, *Loamic
213	082E48	Scc	ScC	Pbc(h)	Anthrosol	Endogleyic Terric	Eutric, Arenic
214	108E01	-	Adco		Albeluvisol	Umbric	Manganiferric, Dystric, Siltic, *Humic
215	108E03	-	Icat	Gba3x	Regosol	Endoleptic	Humic, Eutric, Siltic
216	061E07	(w)Zcx	(w)Zcx	w-Zcfc	Regosol	Endostagnic	*Abruptic, Humic, Dystric, Epiarenic, Endosiltic
217	061E10	wZdx2	wZdx	w-Scfc	Planosol	Haplic	Ruptic, Hyperdystric, Epiarenic, *Endoloamic, *Humic
218	061E12	-	Zdm	Zdfc	Anthrosol	Plaggic Umbric Endostagnic	Hyperdystric, Hyperarenic
219	061E02	wZdg(o)2	wZdg(o)	w-Zdg	Podzol	Bathygleyic Albic	Anthric, Arenic, Endo/Bathyloamic, *Abruptic
220	061E03	Sfp(v)0	Sfpy	Pfpm	Cambisol	Endogleyic Fluvic	Humic, Dystric, *Loamic
221	061W14	Zaf	Zaf	Zbf	Arenosol	Brunic	Hypereutric
222	061W44	gSbfc2	(g)Sbfe	ZAfe	Podzol	Orsteinic	Humic, Dystric, *Abruptic, *Loamic
223	061W50	(u)SbfcC	Sbfc	Sbfc	Cambisol	Haplic	Hyperdystric, Ruptic, *Loamic
224	014E21	sLepy2	BS8	Eep	Cambisol	Endogleyic Fluvic	Calcaric, Humic, Ruptic, *Loamic, Endo-Bathyarenic, *Drainic
225	014E22	wEdp2	A3	Eep	Cambisol	Endogleyic Fluvic	Calcaric, Humic, Ruptic, Episiltic,

Nr	ID_PROF	AW-93	SERIE_txt	BSC_Map	RSG-2007	PreQual	SufQual
							Endoloamic, *Loamic, *Bathyarenic, *Drainic
226	014E30	sEdp2	A3	sEep	Cambisol	Endogleyic Fluvic	Calcaric, Humic, Ruptic, *Loamic, *Drainic
227	015W39	(w)Zcp	GO1 (oud OG 1)		Arenosol	Brunic	Eutric, Bathyabruptic
228	024E13	sEhp2	sEhp	s-Edp	Stagnosol	Endogleyic *Fluvic	Albic, Ruptic, Bathycalcaric, Hypereutric, Epiloamic, Endoarenic, Drainic, *Humic
229	049E03	Sbxc	Sbxy	Sbb	Cambisol	Haplic	Epidystric, Endoeutric, *Loamic
230	090E59	Aba0	Aax	Aba0	Luvisol	Cutanic	Siltic
231	091W31	Aba0	Aa	Aba0	Luvisol	Cutanic	Hypereutric, Siltic
232	091W36	Ahp(c)	A1	Ahp(c)	Luvisol	Stagnic Endogleyic Cutanic	Humic, Hypereutric, Siltic
233	091W35	Aba0	Aa	Aba0	Luvisol	Cutanic	Humic, Hypereutric, Siltic
234	060W16	wZchc2	wZch2	Sdm(g)	Regosol	Endogleyic	Brunic, Humic, Eutric, Arenic, *Endoloamic, *Abruptic, *Ruptic
235	060W19	Zdh(o)cC	Zdh(m)	Sdc	Podzol	Endogleyic	*Humic, *Eutric, *Arenic
236	084W28	Zcp2	Zcm	Zch	Anthrosol	Terric	Eutric, Arenic
237	105E01	Aba1	Aba1	Aba1	Luvisol	Cutanic	Hypereutric, Nudiargic, Siltic
238	105E02	Aba1	Aba1	Aba1	Luvisol	Cutanic	Hypereutric, Nudiargic, Siltic
239	101W08	Abp0	Ca1	Abp(c)	Cambisol	Haplic	Colluvic, Hypereutric, Siltic
240	101W09	Aba1	Aa1	Aba1	Luvisol	Cutanic	Hypereutric, Nudiargic, Siltic
241	101W15	Aba1	Aa1	Aba1	Luvisol	Cutanic	Hypereutric, Nudiargic, Siltic
242	101W16	Ahp0	Cq1	uAfp	Cambisol	Stagnic Endogleyic	Colluvic, Humic, Hypereutric, Siltic
243	085E06	Aca1	Acb	Aca1	Luvisol	Haplic	Hypereutric, Nudiargic, Siltic, *Calcaric
244	085E08	Aba1	Aba1	Aba1	Luvisol	Cutanic	Hypereutric, Siltic
245	085E09	Aba1	Abb	Aba1	Luvisol	Haplic	Hypereutric, Nudiargic, Siltic
246	085E15	Ada1	Ada1	Ada1	Luvisol	Endogleyic	Hypereutric, Nudiargic, Siltic
247	055E07	Zbp0	Ag1	Zbp	Arenosol	Brunic	Dystric
248	055E10	Zbp0	Ag2	Zcp	Arenosol	Brunic	Dystric
249	070E06	Zdp0	Zdp - Zdf	Zcp	Arenosol	Endogleyic Brunic	Dystric
250	0	Zap1	zWa1 (oudsymbool DMf)	w-Sdg	Regosol	Haplic	Brunic, Dystric, Arenic) over Albic Podzol (Loamic)

Nr	ID_PROF	AW-93	SERIE_txt	BSC_Map	RSG-2007	PreQual	SufQual
251	070E03	Pbc0	Pbc	wLhc	Cambisol	Haplic	Dystric, *Loamic
252	070E04	Lcx	Lcc	(w)Ldc	Albeluvisol	Cutanic Fragic	Dystric, *Loamic
253	070E09	(w)Lba0	(w)Lba	Lbc	Luvisol	Cutanic	Hypereutric, *Loamic
254	089W11	Abb	Abb	Aba1	Luvisol	Cutanic	Siltic, *Colluvic
255	089W12	Aba(b)1	Aba(b)0	Aba(b)	Albeluvisol	Cutanic	Dystric, Siltic
256	072E21	Abb	A3 (oud symbool DE)	AbB	Luvisol	Cutanic	Hypereutric, Nudiargic, Siltic
257	072E28	AbB2	A4 (oud symbool E)	AbB	Regosol	Haplic	Calcaric, Siltic
258	089E35	Abb	Abb1	AbB	Cambisol	Haplic	Bathycalcaric, Hypereutric, Siltic
259	102E47	AbB3	Ae5	AbB	Regosol	Haplic	Calcaric, Siltic
260	119E18	AbB2	Ae2	AbB2	Luvisol	Cutanic	Hypereutric, Nudiargic, Siltic
261	119E19	AbB3	Ae3	AbB3	Cambisol	Haplic	Bathycalcaric, Hypereutric, Siltic
262	002E02	Zdg	Zdg	Zdg	Podzol	Endogleyic Albic	*Humic, *Dystric, *Arenic
263	032E09	Zdg(o)	Zdg(o)	t-Zdg	Podzol	Endogleyic Albic	*Humic, *Dystric, *Arenic
264	032E15	Zdg(o)	Zdg(o)	t-Sdg	Podzol	Endogleyic Albic	*Humic, *Dystric, *Arenic
265	002E01	Zag	Zag	ZAgb	Podzol	Albic	*Hypolamellic, *Arenic
266	001E11	Zag	Za1 (oud symbool H1)	ZAg	Podzol	Albic	*Arenic
267	038E37	Zag(o)	Zagd (oud symbool T.Ba1)	Zagdz	Podzol	Aric-Albic	*Arenic
268	041W49	Zag(o)	Zag (oud symbool Ba1)	Zag(o)(z)	Podzol	Aric-Albic	*Arenic
269	059E32	Zag(o)	Zag	ZaF	Podzol	Albic	*Hypolamellic, *Arenic
270	007W18	Zgp(v)0	Zfp(v) (oud symbool: SR11)	vSfp	Gleysol	Mollic Fluvic	Humic, Eutric, Arenic
271	036E01	D4	Type (M)D4 (A3ZZ)	m.D5	Cambisol	Gleyic Fluvic	Hypercalcaric, Clayic, *Loamic, Arenic, *Polyruptic
272	026W18	Zgp0	Dd2 (oud symbool: c2)	sPep	Anthrosol	Epigleyic Terric	Arenic, *Calcaric
273	061E13	Zgp0	Zgp	Pfpz	Gleysol	Fluvic	Humic, Dystric, Arenic
274	001E15	Lgp(v)	Lu1 (oud symbool Ms)	w-Pfg	Gleysol	Fluvic	Humic, Dystric, Siltic

Nr	ID_PROF	AW-93	SERIE_txt	BSC_Map	RSG-2007	PreQual	SufQual
275	028E07	Agp0	Lfp	w-Leb	Gleysol	Fluvic Brunic Rubic	Calcaric, Humic, Siltic
276	029E/02	Zbc	Zbc	w-Sep	Arenosol	Hypoluvic	Dystric
277	029E/12	Zec	Zec	Zeg	Anthrosol	Endogleyic Terric Brunic Albic	Eutric, Arenic, *Albic, *Hypoluvic
278	029W/16	Zac	Zaf	X	Arenosol	Hypoluvic	Dystric
279	061W/09	(w)Zcc	(w)ZcG (oud symbool: wScG)	Sbfc	Podzol	Albic	Ruptic, *Arenic
280	075W/28	Zhc	Zhc	Sdg	Arenosol	Stagnic Endogleyic	Dystric, *Humic
281	053E15	Ldc0	Ldc0	Lcc	Cambisol	Endogleyic	Hypereutric, Bathyruptic, Siltic
282	053W14	Ldc0	Ldc0	Ldc	Cambisol	Endogleyic	Eutric, Bathyruptic, *Loamic
283	065E29	Ldcz1	LS2 (oud symbool L3)	Lca	Cambisol	Endogleyic	Hypereutric, Bathyruptic, *Loamic
284	065E33	Ldc1	LS2 (oud symbool L3)	Lca	Cambisol	Endogleyic	Hypereutric, Bathyruptic, Siltic
285	066W56	Ldc0	Ca2 (oud symbool L3ZZ)	Ldp	Cambisol	Endogleyic	Hypereutric, Bathyruptic, *Loamic
286	043E04	Ldc(o)cC0	Ldc0	Pdc	Albeluvisol	Endogleyic Cutanic	Eutric, *Loamic, *Humic
287	036E02	D5	Type (M)D5 (oud symbool A2)	m.D5	Cambisol	Gleyic Fluvic	Hypercalcaric, Clayic, *Loamic, Arenic, *Polyruptic
288	036E05	D4	Type (M) D4 (A3)	m.D5	Cambisol	Gleyic Fluvic	Hypercalcaric, Clayic, *Loamic, Arenic, *Polyruptic
289	071W04	Ldc0		Ldc	Luvisol	Endogleyic Cutanic	Siltic
290	074W06	Ldcc1	Ldc0	Aeb	Luvisol	Endogleyic Cutanic	Siltic
291	076W02	Ldc0		wLdc	Albeluvisol	Endogleyic Cutanic	Dystric, *Loamic
292	090E05	Ldc0	xAg	U-L-S	Luvisol	Endogleyic Cutanic	Siltic
293	090W17	Ldc0	Ldc0	Lda0	Albeluvisol	Endogleyic Cutanic	Bathyabruptic, Dystric, Siltic
294	091E16	Ldc0	Ld0	Lccz	Luvisol	Endogleyic Cutanic	*Loamic
295	097E17	Ldc0	Pcc	Lda	Luvisol	Endogleyic Cutanic	Siltic
296	023E16	Zbg(o)	Type Aj1 (oud symbool B4)	Zdg	Podzol	Aric-Albic	Anthric, *Dystric, *Arenic
297	023E17	Zcg(o)	Type Aj2 (oud	Zcg	Podzol	Aric-Albic	Anthric, *Dystric, *Arenic

Nr	ID_PROF	AW-93	SERIE_txt	BSC_Map	RSG-2007	PreQual	SufQual
			symbool B3)				
298	041E17	Zcg	Zeg (oud symbool Bo2)	ZbP	Podzol	Albic	*Dystric, *Arenic
299	055E68	Zbg	Type Ag2 (II a H)	Zch	Podzol	Albic	*Dystric, *Arenic
300	056W05	Zbg	Type Ia	Zap(z)	Podzol	Albic	*Dystric, *Arenic
301	056W09	Zcg	Type 2m	Zdb	Podzol	Albic	*Dystric, *Arenic
302	090W07	Aia0	Aia	Lic	Stagnosol	Umbric Luvic	Albic, Bathyruptic, Siltic, *Humic
303	016E10	Zcm	Zçm	w-Zcm	Anthrosol	Endostagnic Plaggic	Dystric, Arenic, *Bathyabruptic
304	053E11	Pcc0	Pce0	Pcc	Luvisol	Endogleyic Albic	Humic, *Loamic
305	053E12	Pcc0	Poc0	Pbc	Luvisol	Endogleyic Albic	*Loamic
306	067E15	Pcc0	Pcc0 (oud symbool: Pcc)	Pcc	Cambisol	Stagnic Endogleyic	Hypereutric, *Loamic
307	067E17	Pcc0	Pcc0 (oud symbool: Pcc)	Pcc	Luvisol	Endogleyic Albic	*Loamic
308	055W02	Pcc(o)0	E2 (oud symbool SS3)	Pbc	Cambisol	Stagnic Endogleyic	Dystric, *Loamic
309	083W45	Pccz1	Pce (oud symbool L3kk)	Pcc	Cambisol	Stagnic Endogleyic	Dystric, *Loamic
310	096E06	Pcc0	Cg2 (oud symbool: S3k)	Lca	Luvisol	Endogleyic Albic Cutanic	Hypereutric, *Loamic
311	096E17	Pcc0	Cg2 (oud symbool: S3k)	Pca	Luvisol	Endogleyic	*Loamic
312	096W15	Pcc1	Cg2 (oud symbool: S3k)	Pba	Luvisol	Endogleyic	*Loamic
313	097W04	Pcc0	lPcc (oudsymbool: lPs)	Lca	Luvisol	Endogleyic	Hypereutric, *Loamic
314	097W09	Pcc0	lPcc (oudsymbool: lPs)	Pcc	Cambisol	Endogleyic	Hypereutric, *Loamic
315	097W12	Pcc0	Pce (oud symbool Ps)	Pcc	Cambisol	Endogleyic	Hypereutric, *Loamic
316	057E42	PcccC0	Cg1 (oud symbool II SOSS br)	Pdc	Cambisol	Endogleyic	Hypereutric, *Loamic
317	090E09	Ahc0	Agx	Lhc	Albeluvisol	Stagnic Cutanic	Eutric, Siltic

Nr	ID_PROF	AW-93	SERIE_txt	BSC_Map	RSG-2007	PreQual	SufQual
318	090E14	Ahc0	Ah	Lhc	Albeluvisol	Stagnic Cutanic	Eutric, Siltic
319	090E15	Ahc0	Lh	Lhc	Albeluvisol	Stagnic Cutanic	Eutric, Siltic, *Humic
320	044W10	LhccC1	Lhc1	Lhc	Albeluvisol	Stagnic Cutanic	Eutric, Siltic, *Terric
321	052W32	Lhc0	Type L3 (oud symbool L2Lz)	Ldc	Albeluvisol	Stagnic Cutanic	Bathyruptic, Hypereutric, Loamic, *Terric,
322	065E45	Lhc0	LS3 (oud symbool L2)	Ldc	Albeluvisol	Stagnic Cutanic	Bathyabruptic, Hypereutric, Siltic, *Terric,
323	066E06	Lhc0	Type L2z	Ldc	Albeluvisol	Stagnic Cutanic	Bathyruptic, Hypereutric, Loamic, *Terric,
324	037W15	Sdbz	Am3 (oud symbool Z2Cz)	SdP	Cambisol	Endogleyic	Eutric, Endoarenic, *Loamic, *Bathyabruptic
325	037W33	Sdbz	Am3 (oud symbool Z2)	ZdG	Cambisol	Endogleyic	Eutric, Endoarenic, *Loamic, *Bathyabruptic
326	041W08	Sdbz	Zdc (oud symbool Cd1)	Sdb(k)	Cambisol	Endogleyic	Eutric, *Loamic
327	041W13	Sdb	Sdc (oud symbool Cd3)	Zdb	Cambisol	Endogleyic	Eutric, *Loamic
328	089E05	SDg	wSDg2	wLcc	Podzol	Endogleyic Albic	*Loamic
329	089E16	sPbf2	sPbf2	SAg	Podzol	Endogleyic Albic	*Loamic
330	089E17	sLbc2	sLbc0	sPbC	Podzol	Endogleyic Albic	*Loamic
331	041W06	Zdb(o)	Zdf (oud symbool Bd1)	Zdh	Arenosol	Endogleyic Brunic	Eutric, *Terric
332	041W07	Zdb	Zdc (oud symbool Cd1)	Sdb(k)	Podzol	Endogleyic Aric-Albic	Eutric, *Terric
333	037W62	Zdb	type Am2 (oud symbool Z3M)	ZcG	Arenosol	Endogleyic Brunic	Endoeutric
334	037W64	Zdb	type Am3 (oud symbool Z2)	ZcF	Arenosol	Endogleyic Brunic	Hypereutric
335	011W06	E1	E1 (oude symbolen M - A1)	m.E1	Cambisol	Endogleyic Fluvic	Hypercalcaric, *Loamic
336	007W26	Zbf	Zbpb(h) (Oudsymbool Wfa2)	Zbm	Arenosol	Brunic	Dystric, *Plaggic
337	016W31	Zbf	Zhb1 (Oudsymbool	w-Zdg	Arenosol	Brunic	Dystric, *Aric-Spodic

Nr	ID_PROF	AW-93	SERIE_txt	BSC_Map	RSG-2007	PreQual	SufQual
			B1)				
338	076E07	Zhp(v)0	Zhp	Lfpz	Fluvisol	Stagnic	Dystric, Arenic
339	077E06	Zdpy0	Zdp1y	Sdm(b)	Arenosol	Endogleyic Brunic	Eutric, *Humic
340	014E03	Udpz0	Type A2	Uep	Phaeozem	Endogleyic	Endocalcaric, Clayic, *Fluvic, *Ruptic, *Drainic
341	014E06	Udp0	Type NA1	Udp	Phaeozem	Endogleyic	Calcaric, Clayic, *Fluvic, *Drainic
342	014E40	Udpz0	Type A2	sUep	Phaeozem	Endogleyic	Calcaric, Epiclayic, *Fluvic, *Ruptic, *Drainic
343	014E42	Udp0	Type NA1	Udp	Phaeozem	Endogleyic	Calcaric, Clayic, *Fluvic, *Drainic
344	014E53	Edpz0	Type NA3	Edp	Phaeozem	Endogleyic	Calcaric, *Loamic, *Fluvic, *Drainic
345	014E55	Edp0	Type B	Pep	Phaeozem	Endogleyic	Calcaric, *Loamic, *Fluvic, *Drainic
346	014W01	Edp0	Type A3	Udp	Phaeozem	Endogleyic	Calcaric, *Loamic, *Fluvic, *Drainic
347	027E71	Edpy0	Type Bk	Pep	Phaeozem	Endogleyic	Calcaric, *Loamic, *Fluvic, *Drainic
348	014W07	Ldp0	Type A3	Eep	Phaeozem	Endogleyic	Calcaric, *Loamic, *Fluvic, *Drainic, *Bathyruptic
349	015W18	uLdp2	Type Ck	Eep	Phaeozem	Stagnic Endogleyic	Calcaric, *Loamic, *Fluvic, *Drainic, *Bathyruptic
350	015W19	wLdp2	Type CK	uPep	Phaeozem	Stagnic Endogleyic	Calcaric, *Loamic, *Fluvic, *Drainic, *Bathyruptic
351	038E60	Sdpy1	lSdg (oud symbool Bh1)	Sdh	Cambisol	Endogleyic	Dystric, *Loamic
352	023E22	Sepz0	Type CAg6 (oud symbool C1)	Sfpz(k)	Phaeozem	Gleyic	Endoarenic, *Loamic
353	027W72	Pdc0	Type Fk1	Sdb	Cambisol	Endogleyic Terric	Eutric, *Loamic
354	057E18	PdccC0	Type Dc4 (oud symbool Dx)	Pdg	Phaeozem	Endogleyic	*Loamic
355	058W21	Pdc0	(Oud symbool 2SSbgr)	Pcc	Stagnosol	Mollic Endogleyic	Eutric, *Loamic
356	057E43	Pdc(o)0	Type Cg1 (oud symbool li SOSS br)	Pdc	Phaeozem	Luvic Endogleyic	*Loamic
357	069E06	Pdc0	Pdco	Pcc	Cambisol	Endogleyic	Eutric, *Loamic

Nr	ID_PROF	AW-93	SERIE_txt	BSC_Map	RSG-2007	PreQual	SufQual
358	017W07	Pdcy0	Pdc(m)	Sdcy	Phaeozem	Luvic Stagnic Endogleyic	*Loamic
359	006W20	lSdf2	uSd2 (oud symbool M1K1)	w-Seg	Umbrisol	Cambic	Anthric, Humic, Hyperdystric, *Loamic, *Ruptic
360	007E24	Sdf	Sdf(m)	Pdm	Phaeozem	Endogleyic	*Loamic
361	007E27	uSdf2	uSdf	w-Sdh3(h)	Phaeozem	Stagnic Endogleyic	Abruptic, *Loamic
362	066E34	Lhcz0	Type L3z	Ldpz	Albeluvisol	Stagnic Cutanic	Bathyruptic, Hypereutric, Loamic
363	066E47	Lhcz0	Type L3	Lcaz	Albeluvisol	Stagnic Cutanic	Hypereutric, Loamic
364	023E65	Sepz0	Type T2 (III TSD)	Sfpz(k)	Phaeozem	Gleyic	Endoarenic, *Loamic
365	055e66	Sepz0	Type T1 (TZ)	Sep	Umbrisol	Cambic Endogleyic	Endoeutric, *Ruptic, *Loamic
366	056W33	Sep0	Type 2mSS	Sdp	Umbrisol	Cambic Endogleyic	Endoeutric, *Loamic
367	029W09	SepcC0	Sepmz	s-Efp3	Fluvisol	Endogleyic	Dystric, Arenic
368	013W02	?	Sepz	Pep	Fluvisol	Gleyic	Calcaric, *Loamic
369	076W08	Lic0	Lie	Lhc	Albeluvisol	Stagnic Endogleyic Albic	Eutric, Siltic, *Humic
370	091W45	Lic0	Lw	uLhc	Albeluvisol	Stagnic Endogleyic Albic	Bathyabruptic, Dystric, Siltic
371	104W48	Lip0	D1	U-L-S	Cambisol	Stagnic	Eutric, Siltic, Bathyruptic
372	080E07	Lca0	Lcao	Lcaz	Luvisol	Endogleyic	Hypereutric, Siltic
373	081E06	Lca0	Oudsymbool L3	Pcc	Cambisol	Endogleyic	Hypereutric, Loamic
374	081E07	Lcay1	Oudsymbool L3	Lcaz	Luvisol	Endogleyic	Hypereutric, Loamic
375	081W05	Lca0	Oudsymbool (Lba)	Lca	Cambisol	Endogleyic	Hypereutric, Loamic
376	058W06	Pcc0	Oud symbool: 2SSbgr	Sdc(h)	Umbrisol	Cambic	Anthric, Humic, *Loamic
377	058W46	Pcc0	Oud symbool: 2bgr	Lhp	Cambisol	Haplic	Eutric, *Loamic
378	055W15	Sepz0	CS1 (oud symbool: C1)	Lep	Phaeozem	Cambic Endogleyic	Endoarenic, *Loamic
379	055W21	wUepz2	B1 (oud symbool kk)	Ufp	Phaeozem	Cambic Endogleyic	Endoruptic, *Loamic
380	055W31	Sepz0	B4 (oud symbool -)	Lep	Cambisol	Endogleyic Fluvic	Endoarenic, *Loamic
381	055W36	sLep(o)2	CS2 (oud symbool: K)	Lep	Cambisol	Endogleyic Fluvic	Calcaric, Humic, Endoarenic, *Loamic

Nr	ID_PROF	AW-93	SERIE_txt	BSC_Map	RSG-2007	PreQual	SufQual
382	069E03	Zcg(o)	Zcg(0)	Zcc(h)	Arenosol	Hypoluvic	Dystric, *Humic
383	042E77	Eep(v)0	Type D3 (oud symbool: Bk)	vEep	Phaeozem	Endogleyic *Fluvic	Calcaric, *Loamic
384	057E33	uEepcC3	VB1b (oud symbook: KK)	Efp	Cambisol	Endogleyic Fluvic	Eutric, Endoclayic, *Loamic
385	050E58	wLda2	L2Z type (nieuw Ca7)	Lca	Cambisol	Haplic	Hypereutric, Endoruptic, Siltic, Endo- to Bathy-arenic
386	054E11	wLda2	Lda (oud symbool: IIScLL)	Ldc	Albeluvisol	Stagnic Endogleyic	Eutric, *Loamic
387	073W52	wLdacC2	Type L3 (oud symbool Bhz)	Ldcz	Albeluvisol	Stagnic Endogleyic	Eutric, *Loamic
388	077W11	wLdac2	wLdao	Lhcz	Planosol	Endogleyic	Ruptic, Hypereutric, *Loamic
389	084W19	wLda2	wLba	wLdc	Planosol	Endogleyic	Ruptic, Hypereutric, *Loamic
390	082E42	wLda2	uLda	u-Ldc	Planosol	Endogleyic	Ruptic, Eutric, *Loamic
391	054W03	wLha2	wLha1	w-Ldc	Planosol	Endogleyic	Ruptic, Hypereutric, *Loamic
392	076W20	Aep0	Aea	Ldp(c)	Fluvisol	Endogleyic	Humic, Hypereutric, Siltic
393	090W13	Afp0	Afp	Agp	Fluvisol	Gleyic Histic	Hypereutric, Siltic
394	021E07	A1/A2	Type A1/A2	m.E1	Cambisol	Endogleyic Fluvic	Calcaric, Endoruptic, Siltic/$Clayic
395	021E09	A2	Type A2	m.E1	Cambisol	Endogleyic Fluvic	Calcaric, Humic, Endoruptic, $Clayic
396	021E10	A1	Type A1	m.E1	Cambisol	Endogleyic Fluvic	Calcaric, Humic, $Clayic
397	011E59	A6	Type (O) A6 (oud symbool l)	m.F1	Cambisol	Gleyic Fluvic	Endocalcaric, *Loamic, Bathyarenic
398	021E11	AD1	Type AD1	m.F1	Cambisol	Gleyic Fluvic	Endocalcaric, Endoclayic, Humic, *Polyruptic
399	036E06	F1	Type (M) F1 (A1D)	m.F1	Cambisol	Gleyic Fluvic	Endocalcaric, Clayic, Humic
400	036E20	F1	Type (M) F1 (A1D)	m.F1	Cambisol	Gleyic Fluvic	Endocalcaric, Clayic, Humic
401	036E21	F1	Type (M) F1 (A1D)	m.F1	Cambisol	Gleyic Fluvic	Endocalcaric, Clayic, Humic
402	036E33	P5	Type (M) P5 (oud symbool P2B)	m.F2	Gleysol	Fluvic	Epicalcaric, Humic, Epiclayic, Endoarenic, Endoruptic
403	036E36	B2	Type M(B2) (oud symbool A1V)	m.F2	Gleysol	Thaptohistic Fluvic	Calcaric, Humic, Clayic
404	051E49	F2	TYPE (M)F2 (oud	m.F2	Gleysol	Thaptohistic Fluvic	Hypercalcaric, Humic, Clayic

Nr	ID_PROF	AW-93	SERIE_txt	BSC_Map	RSG-2007	PreQual	SufQual
405	066W26	Bk2	symbool A1DV), Type (O)Bk2 (oud symbool 7V)	m.Fc2	Gleysol	Fluvic Thaptohistic	Eutric, Humic, *Drainic
406	011W09	Fk1	Type Fk1 (oude symbolen Cc4 - Z1)	m.Fk1	Cambisol	Endogleyic Fluvic	Calcaric, Clayic, Bathy-thaptohistic
407	011W22	Fk1	Type Fk1 (oude symbolen Z1 - Cc4)	m.Fk1	Cambisol	Endogleyic Fluvic	Hypereutric, *Loamic
408	011W39	Fk1	Type Fk1 (oude symbolen Z1 - Oo4)	m.Fk1	Cambisol	Endogleyic Fluvic	Calcaric, Clayic
409	021E22	A1L	Type A-1L	m.G2	Cambisol	Endogleyic Fluvic	Hypercalcaric, Humic, Clayic, *Drainic
410	021E28	A1Ln	Type A-1Ln	m.G2	Cambisol	Endogleyic Fluvic	Hypercalcaric, Humic, Clayic, *Drainic
411	036W53	A1	Type A1	m.G2	Cambisol	Endogleyic Fluvic	Hypercalcaric, Humic, Clayic, *Drainic
412	036W72	A1L	Type A1L	m.G2	Cambisol	Endogleyic Fluvic	Hypercalcaric, Clayic, *Drainic
413	051E25	E1	Type (M)E1 (A1)	m.G2	Cambisol	Endogleyic Fluvic	Hypercalcaric, Humic, Clayic, *Drainic
414	051E26	G2	Type (M)G2 (A1L)	m.G2	Cambisol	Endogleyic Fluvic	Hypercalcaric, Humic, Clayic, *Drainic
415	022E/68	M1	Type M1 (oud symbool OU6)	m.M1	Arenosol	Endogleyic Brunic	Eutric, *Humic, *Drainic
416	022E/69	M1	Type M1 (oud symbool OU6)	m.M1	Arenosol	Endogleyic Brunic	Eutric, *Humic, *Drainic
417	022E/77	M1	Type M1 (oud symbool OU6)	m.M1	Arenosol	Endogleyic Brunic	Eutric, *Humic, *Drainic
418	022E/72	M5	Type M5 (oud symbool OU3)	m.M2	Fluvisol	Endogleyic	Hyperhumic, Eutric, *Epiclayic, *Endoarenic, *Ruptic, *Drainic
419	022E/74	M4	Type M4 (oud symbool OU4)	m.M2	Fluvisol	Endogleyic	Humic, Eutric, *Epiclayic, *Endoarenic, *Ruptic, *Drainic
420	022E/76	M3	Type M3 (oude symbool OU2)	m.M2	*Fluvisol*	Mollic Endogleyic	Humic, Eutric, *Epiloamic, *Endoarenic, *Ruptic, *Drainic
421	036E/34	P6	Type M(P6)	m.M2	Cambisol	Endogleyic Fluvic	Humic, Eutric, Amphicalcaric, *Epiloamic, *Amphiclayic, *Endoarenic, *Polyruptic, *Drainic
422	066W/21	OU1P	Type OU1P (oud symbool U1P)	m.M2	Cambisol	Endogleyic Fluvic	Hyperhumic, Eutric, Epicalcaric, *Epiloamic, *Amphiclayic, *Endoarenic,

Nr	ID_PROF	AW-93	SERIE_txt	BSC_Map	RSG-2007	PreQual	SufQual
							*Polyruptic, *Drainic
423	022E/66	M5	Type M5 (oud symbool OU3)	m.M2	Fluvisol	Endogleyic	Humic, Eutric, *Epiloamic, *Endoarenic, *Ruptic, *Drainic
424	022E/67	M1	Type M1 (oud symbool OU6)	m.M2	Arenosol	Endogleyic Brunic	Eutric
425	022E/70	M3	Type M3 (oud symbool OU5)	m.M2	Phaeozem over Arenosol	Endogleyic Fluvic	Humic, Ruptic, *Epiloamic, * Endoarenic, *Drainic
426	022E/71	M4	Type M4 (oud symbool OU4)	m.M2	Phaeozem over Arenosol	Endogleyic Fluvic	Humic, Ruptic, *Epiloamic, * Endoarenic, *Drainic
427	022W69	P1	Type (O)P1 (LG2)	m.P1	Regosol	Endogleyic	Eutric, Epiloamic, Endoarenic, Endoruptic
428	024W13	P1	Type P1 (oud symbool lg2)	m.P1	Regosol	Endogleyic	Eutric, Epiloamic, Endoarenic, Endoruptic
429	037W69	P1	Type P1 (oud symbool LG2)	m.P1	Regosol	Endogleyic	Eutric, Epiloamic, Endoarenic, Endoruptic
430	022E40	P4	Type P4 (ZG1)	m.P1	Stagnosol	Endogleyic	Hypereutric, Endoarenic, Endoruptic
431	022W68	P2	Type (O)P2 (LG1)	m.P2	Regosol	Endogleyic	Eutric, Epiloamic, Endoarenic, Endoruptic
432	024W10	P3	Type P3 (ZG2)	m.P3	Phaeozem	Endogleyic	Epiloamic, Endoarenic, Endoruptic, *Fluvic
433	024W12	P3	Type P3 (ZG2)	m.P3	Phaeozem	Endogleyic	Epiloamic, Endoarenic, Endoruptic, *Fluvic
434	051E35	P3	Type P3 (oud symbool PG2)	m.P3	Phaeozem	Endogleyic	Epiloamic, Clayic, Endosiltic, Polyruptic, *Fluvic
435	065E31	P3	Type P3 (oud symbool PG2)	m.P3	Phaeozem	Endogleyic	Siltic, Endo-Bathyclayic, Polyruptic
436	051E54	T3	Type T3 (oud symbool ZGYY)	m.P3	Planosol	Endogleyic Fluvic	Hypereutric, Epiloamic, Endoclayic, Endoruptic
437	050E40	uLhp2	PG2-type (nieuw P3)	m.P4	Planosol	Haplic	Hypereutric, Endosiltic
438	051E34	P4	Type P4 (oud symbool PG1)	m.P4	Planosol	Endogleyic	Hypereutric, Humic, Siltic, Clayic, Bathyarenic, Polyruptic
439	066W25	P4	Type (O)P4 (PG1)	m.P4	Planosol	Endogleyic	Hypereutric, Humic, *Loamic, Clayic, Bathyarenic, Polyruptic
440	066W67	P4	Type (O)P4 (PG1)	m.P4	Planosol	Endogleyic	Hypereutric, Humic, Clayic, Endosiltic,

Nr	ID_PROF	AW-93	SERIE_txt	BSC_Map	RSG-2007	PreQual	SufQual
							Polyruptic
441	059E39	ScmcC	Scm	lSdm(g)	Anthrosol	Endostagnic Bathygleyic Plaggic	Dystric, Arenic, *Bathy-abruptic
442	059E46	(w)ZdgcC	(w)Zdg	lSdh	Podzol	Endogleyic	*Abruptic, *Arenic, *Aric
443	036E50	P5	Type (M)P5 (P2B)	m.P5	Gleysol	Fluvic	Hypereutric, Humic, Epiloamic, Clayic, Endoarenic, Polyruptic
444	037W48	P5	Type P5 (P2B)	m.P5	Stagnosol	Endogleyic Fluvic	Hypereutric, Humic, Epiclayic, Loamic, Epiruptic
445	037W68	P5	Type P5 (P2B)	m.P5	Stagnosol	Endogleyic Fluvic	Hypereutric, Epiclayic, Loamic, Epiruptic
446	065E39	P5	Type P5 (P2)	m.P5	Stagnosol	Endogleyic Fluvic	Hypereutric, Humic, Epiclayic, Endosiltic, Endoruptic
447	050E30	sUhp(v)	PG1-type	m.P6	Phaeozem	Endostagnic *Fluvic	Hypercalcaric, Siltic, *Humic, *Drainic, *Ruptic
448	050W02	P6	Type (0)P6 (P1By)	m.P6	Cambisol	Endogleyic Fluvic	Calcaric, Humic, Endoclayic, Drainic, *Abruptic, *Ruptic
449	022E55	Pb2	Type Pb2 (6Vp)	m.Pb2	Gleysol	Thaptohistic Fluvic	Hypereutric, Humic, Epiclayic, Endoarenic, Endoruptic
450	023W22	Pk6	Type Pk6 (oudsymbool K1DP)	m.Pk2	Cambisol	Endogleyic Fluvic	Hypercalcaric, Loamic, Bathyarenic, Polyruptic
451	051W65	-	Type P1	m.T6	Cambisol	Endogleyic Fluvic	Humic, Epiclayic, Endoarenic, Polyruptic
452	035E06	uLhp2	6Vx	m.W1	Gleysol	Fluvic	Calcaric, Humic, Siltic, *Ruptic
453	050E41	uEcpz2	Type 6/1	m.W1	Cambisol	Endogleyic Fluvic	Calcaric, Humic, Loamic, Bathyarenic, Bathyruptic
454	050E50	lUdp	6/1 en 6/2 type (nieuw W1 type)	m.W1	Phaeozem	Endogleyic *Fluvic	Bathycalcaric, Abruptic, Ruptic, *Humic
455	050E51	vUep	U1 type (nieuw OU2)	m.W1	Gleysol	Thaptohistic Fluvic	Calcaric, Humic, Ruptic, *Epiloamic, *Endoclayic, *Endosiltic
456	050E53	vEfp2	Type 6V (tP)	m.W1	Cambisol	Endogleyic Fluvic	Calcaric, Humic, Loamic, Endoclayic, Endoloamic, Polyruptic
457	050W06	uZep(v)2	Type (D)S2k	m.W1	Fluvisol	Endogleyic	Hypercalcaric, Humic, Epiarenic, *Ruptic
458	050W07	DC1	Type (W)DC1	m.W1	Phaeozem	Endogleyic *Fluvic	Endocalcaric, Abruptic, Ruptic, Drainic
459	050W11	W1	Type (O)W1	m.W1	Cambisol	Endogleyic Fluvic	Hypercalcaric, Humic, Epiclayic,

Nr	ID_PROF	AW-93	SERIE_txt	BSC_Map	RSG-2007	PreQual	SufQual
460	050W08	Zcp(v)0	Type (D)D1E	m.W2k	Arenosol	Brunic	Endoarenic, Drainic, *Abruptic, *Ruptic Epicalcaric, Hypereutric, Drainic, *Humic, *Bathyabruptic
461	050E55	Eep0	Type 4 K// 2/2	m.W2z	Cambisol	Endogleyic Fluvic	Calcaric, Humic, Loamic, Polyruptic
462	050W09	W1	Type (O)W1 (6/2)	m.W2z	Cambisol	Endogleyic Fluvic	Hypercalcaric, Humic, Epiloamic, Endoarenic, Endoruptic
463	036W19	O Z	Type O Z	n.B2	Cambisol	Endogleyic Fluvic	Hypercalcaric, Humic, Loamic, Endoarenic
464	036W54	N3Z	Type N3Z	n.B2	Cambisol	Endogleyic Fluvic	Hypercalcaric, Loamic, Endoarenic, Polyruptic
465	021E20	I SS	Type I SS	n.G2	Cambisol	Gleyic Fluvic	Hypercalcaric, Clayic
466	061E01	(u)Zdx	(u)Zdx	w-Zdcc	Arenosol	Endostagnic	Bathyabruptic, Humic, Dystric
467	061E05	wZdg(o)2	wZdg(o)	w-Zdfc	Podzol	Endostagnic Aric-Albic	*Abruptic, *Arenic
468	022W13	G2	G2 type (oudsymbool 1 L)	n.G2	Cambisol	Gleyic Fluvic	Hypercalcaric, Clayic
469	021E02		A3Z Type	n.K1	Cambisol	Endogleyic Fluvic	Hypercalcaric, Clayic, Endoarenic, Polyruptic
470	021E18	IV	IV Type	n.K1	Cambisol	Endogleyic Fluvic	Hypercalcaric, Loamic, Clayic, Abruptic, Polyruptic
471	022W09	A3	Type (H)A3 (III)	n.K1	Cambisol	Endogleyic Fluvic	Hypercalcaric, Clayic, Bathyloamic, Bathyruptic
472	022W40	Ab5	Type (H)Ab5 (IIIb)	n.K1	Cambisol	Endogleyic Fluvic	Hypercalcaric, Humic, Clayic, Bathyloamic, Bathyruptic
473	022W01	Ab4	Type (H)Ab4 (IIIbq)	n.K1l	Cambisol	Endogleyic Fluvic	Hypercalcaric, Humic, Epiclayic, Endoloamic, Endoruptic
474	022W02	A3	Type (H)Ab3 (III)	n.K1l	Cambisol	Endogleyic Fluvic	Hypercalcaric, Loamic, Bathyruptic
475	022W03	Ab4	Type (H)Ab4 (IIIbq)	n.K1l	Cambisol	Endogleyic Fluvic	Hypercalcaric, Humic, Epiclayic, Endoloamic, Bathyruptic
476	022W10	Ab4	Type (H)Ab4 (IIIbq)	n.K1l	Cambisol	Endogleyic Fluvic	Hypercalcaric, Epiclayic, Loamic, Bathyruptic
477	021E16	IIIq	III Q type	n.K2	Cambisol	Endogleyic Fluvic	Hypercalcaric, Epiclayic, Endoloamic, Endoruptic
478	021E17	III	Type III	n.K2	Cambisol	Endogleyic Fluvic	Hypercalcaric, Clayic, Polyruptic

Nr	ID_PROF	AW-93	SERIE_txt	BSC_Map	RSG-2007	PreQual	SufQual
479	021E25	II	Type II	n.K2	Cambisol	Endogleyic Fluvic	Hypercalcaric, Clayic
480	021E27	II	Type II	n.K2	Cambisol	Endogleyic Fluvic	Hypercalcaric, Humic, Clayic
481	022W08	A3	Type (H) A3 (III D)	n.K2	Cambisol	Endogleyic Fluvic	Hypercalcaric, Clayic, Bathyloamic, Bathyruptic, *Drainic
482	022W41	A1	Type (H) A1 (I)	n.K2	Cambisol	Endogleyic Fluvic	Hypercalcaric, Clayic, Bathyloamic, Bathyruptic, *Drainic
483	021E15	I	Type I	n.K3	Cambisol	Endogleyic Fluvic	Hypercalcaric, Clayic, Bathyloamic, Bathyruptic, *Drainic
484	021E26	I	Type I	n.K3	Cambisol	Endogleyic Fluvic	Hypercalcaric, Humic, Clayic
485	022W12	A1	Type A1 (oud symbool I)	n.K3	Cambisol	Endogleyic Fluvic	Hypercalcaric, Clayic
486	022W14	A2	Type (H)A2 (II)	n.K3	Cambisol	Endogleyic Fluvic	Hypercalcaric, Humic, Clayic
487	035E02		type D1E	OB	Arenosol	Bathygleyic Brunic	Calcaric
488	043W08	Ldc0	Ldc0	OB	Albeluvisol	Endogleyic Cutanic	Eutric, Endosiltic, *Epiloamic
489	011E11	B1	Type variante B1 (1/A3zz)	OC	Arenosol	Endogleyic Fluvic	Hypercalcaric, Transportic, Epiloamic
490	050E21	sLep3	4 KKz-type	OG1	Cambisol	Endogleyic Fluvic	Calcaric, Endoarenic
491	022W55	Zgp0	D3E type	OG1	Gleysol	Haplic	Calcaric, Arenic
492	036W42	G2	G2 type	OG1	Cambisol	Endogleyic Fluvic	Hypercalcaric, Epiclayic, Endoarenic, Endoloamic, Polyruptic
493	036W43	G2Z	Type O2Z	OG1	Regosol	Endogleyic	Hypercalcaric, Epiloamic, Endoarenic, Endoruptic
494	050E27	vUfp2	6V	OV2	Gleysol	Fluvic	Calcaric, Humic, Siltic
495	050E18	Ldc0	Type U1	OV2	Phaeozem	Endogleyic *Fluvic	Pachic, Siltic
496	036E51	G2	Type (M)G2 (oud symbool A1l)	OV2	Cambisol	Endogleyic Fluvic	Endocalcaric, Humic, Clayic, *Drainic
497	037W76	OU2	Type OU2 (oud symbool OU1)	OV2	Cambisol	Endogleyic Fluvic	Endocalcaric, Humic, Clayic, Endoruptic, Endoloamic, Bathyarenic, *Drainic
498	050E37	OU2	Type U1	OV2	Cambisol	Endogleyic Fluvic	Hypercalcaric, Humic, Clayic, *Drainic
499	050E47	OU2	Type U1	OV2	Cambisol	Endogleyic Fluvic	Hypercalcaric, Humic, Clayic, *Drainic
500	051E16	F1	Type (M)F1 (oud symbool A1D)	OV2	Cambisol	Endogleyic Fluvic	Hypercalcaric, Humic, Clayic, *Drainic, *Bathythaptohistic

Nr	ID_PROF	AW-93	SERIE_txt	BSC_Map	RSG-2007	PreQual	SufQual
501	051E80	-	Type (M)B2 (oud symbool AiV)	OV2	Cambisol	Endogleyic Fluvic	Calcaric, Humic, Clayic, *Drainic, *Thaptohistic
502	051W87	-	Type (M)F1 (oud symbool A1D)	OV2	Cambisol	Endogleyic Fluvic	Hypercalcaric, Humic, Clayic, *Drainic, *Thaptohistic
503	051W09	-	Type 4 ZZ-OZ	OZ	Arenosol	Endogleyic Brunic	Calcaric
504	051W12	-	Type 4 KZZ	OZ	Cambisol	Endogleyic Fluvic	Hypercalcaric, Epiloamic, Endoarenic, Endoruptic, *Drainic
505	050W33	DC2	Type (W)DC2 (oud symbool K/1)	r.El	Gleysol	Fluvic	Hypercalcaric, Humic, *Loamic, *Drainic
506	050W29	Db2	Type Db2 (oud symbool KK/2)	r.Elz	Gleysol	Mollic Fluvic	Hypercalcaric, Humic, *Loamic, *Drainic, Endoruptic
507	050W17	C5	Type (W)C5	r.Em	Cambisol	Endogleyic Fluvic	Hypercalcaric, Humic, *Drainic, *Abruptic
508	050W12	C5	Type (W)C5	r.Emz	Fluvisol	Epigleyic	Hypercalcaric, Epiclayic, Drainic, *Ruptic
509	050W32	C3	Type (W)C3 (oud symbool 1S)	r.Emz	Planosol	Endogleyic	Hypercalcaric, *Fluvic, *Loamic, *Drainic
510	050W27	C2	Type (W)C2 (oud symbool 1SSSK)	r.Pl	Gleysol	Fluvic	Hypercalcaric, Epiclayic, Siltic, Endo*Loamic, Drainic, *Endoruptic
511	050W05	E2	Type (W)E2	r.Sl	Cambisol	Endogleyic Fluvic	Hypercalcaric, Humic, Endoarenic, *Drainic, *Ruptic, *Mollic
512	050W30	E3k	Type (W)E3k (oud symbool MW3KK)	r.Sl	Gleysol	Mollic Fluvic	Humic, *Loamic, *Drainic, Endoruptic
513	050W44	E2	Type (W)E2 (oud symbool MW2)	r.Sl	Planosol	Endogleyic	Hypercalcaric, *Humic, *Fluvic, *Loamic, *Drainic
514	050W14	B3	Type (W)B3	r.Sly	Planosol	Endogleyic *Fluvic	Hypercalcaric, Drainic
515	050W69	A3	Type (W)A3 (oud symbool 3K)	r.Sm	Planosol	Endogleyic	Hypercalcaric, *Fluvic, *Arenic, *Endosiltic, *Drainic
516	050W16	C3	Type (W)C3	r.sPm	Planosol	Mollic Endogleyic Fluvic*	Hypercalcaric, Drainic
517	050W28	B1	type (W)B1	r.sPm	Fluvisol	Endogleyic	Calcaric, Endoarenic, *Abruptic
518	050W28	B1	Type (W)B1 (oud symbool 2SS)	r.sPm	Gleysol	Fluvic	Hypercalcaric, Epi*Loamic, Endoarenic, *Drainic, Epiruptic
519	050W67	E3	Type (W)E3 (oud symbool MW3)	r.sPm	Planosol	Endogleyic	Hypercalcaric, *Fluvic, *Loamic, *Drainic

Nr	ID_PROF	AW-93	SERIE_txt	BSC_Map	RSG-2007	PreQual	SufQual
520	050W13	B4	Type (W)B4	r.uPm	Cambisol	Endogleyic Fluvic	Hypercalcaric, Endosiltic, Bathyarenic, Drainic, *Abruptic, *Bathyruptic
521	050W15	C3	Type (W)C3	r.uPm	Gleysol	Fluvic	Abruptic, Hypercalcaric, Endoarenic
522	050W68	C2	Type (W)C2 (oud symbool 1SSSK)	r.uPm	Planosol	Endogleyic	Hypercalcaric, *Humic, *Fluvic, *Loamic, *Amphiclayic, *Bathyarenic, *Drainic
523	050W31	Db2	Type Db2 (oud symbool KK/2)	r.uSl	Gleysol	Mollic Fluvic	Humic, *Loamic, *Drainic, Endoruptic
524	011E40	B2K	Type (N)B2K (A3K)	z.Bb1k	Cambisol	Endogleyic Fluvic	Hypercalcaric, *Loamic, Polyruptic
525	011E01	B3	Type (N)B3 (A2Z)	z.Bb2	Cambisol	Endogleyic Fluvic	Hypercalcaric, Epiloamic, Endoarenic
526	011E03	B3	Type (N)B3 (A2Z)	z.Bb2	Cambisol	Endogleyic Fluvic	Hypercalcaric, Epiloamic, Endoarenic
527	011E04	B3	Type (N)B3 (A2)	z.Bb2	Cambisol	Endogleyic Fluvic	Hypercalcaric, Epiloamic, Endoarenic
528	011E23	B2	Type (N)B2 (A3Z)	z.Bb2	Cambisol	Endogleyic Fluvic	Hypercalcaric, Epiloamic, Endoarenic
529	011E55	B4k	Type (N)B4 (A1K)	z.Bb2	Cambisol	Endogleyic Fluvic	Hypercalcaric, Epiclayic, Endoloamic
530	011W15	Bb2	Type Bb2 (oude symbolen B3 - A2z)	z.Bb2	Cambisol	Endogleyic Fluvic	Hypercalcaric, Epiloamic, Endoarenic
531	011W17	Bb2	Type Bb2 (oude symbolen B3 - A2z)	z.Bb2	Cambisol	Endogleyic Fluvic	Hypercalcaric, Epiloamic, Endoarenic
532	074W22	Scm	Zdx	Scm	Cambisol	Endogleyic Plaggic	Arenic
533	097E01	-	Adh	Adh	Planosol	Endogleyic Mollic	Humic, Eutric
534	097E57	Adb	Adb(a) (oud symbool Cbg-An)	Adb	Cambisol	Endogleyic	Calcaric
535	090W29	Scfc	Scfd	SAfd	Cambisol	Haplic	Dystric, *Loamic
536	090W30	Scfc	Scfd	SAfd	Regosol	Haplic	Dystric, *Loamic
537	090E03	wPdx2	uPx	SAfd	Regosol	Stagnic	Dystric, Siltic
538	120W27	sPbxc3	TI	A-S	Regosol	Stagnic	Eutric, *Loamic
539	p041W/2	$$	mV-E	mV-E	Gleysol	Fluvic Histic	Calcaric, Clayic
540	057W38	ZdfcC	Type Cd2 of Cd1 (oud symbool 2m)	Zbc	Arenosol	Brunic	Dystric, Relictigleyic

Annex 4 – Conversion of the soil types of the coastal areas to Soil Units according to WRB-2007

Landschap	Landeenheid	Code	Soil Unit (WRB-2007)	n
Duinstreek				**9**
	Duingronden			**3**
		d.B1	Brunic Arenosols (Hypercalcaric)	**1**
		d.B2	Endogleyic Brunic Arenosols (Endocalcaric)	**1**
		d.B3	Gleyic Brunic Arenosols (Hypercalcaric)	**1**
	Geëgaliseerde duingrounden			**3**
		d.C1	Protic Arenosols (Hypercalcaric, *Escalic)	**1**
		d.C2	Endogleyic Brunic Arenosols (Hypercalcaric, *Escalic)	**1**
		d.C3	Gleyic Brunic Arenosols (Hypercalcaric, *Escalic)	**1**
	Hoge duinen			**1**
		d.A0	Protic Arenosols (Hypercalcaric)	**1**
	Overgangsgronden			**2**
		d.Da	Endostagnic Arenosols (Endocalcaric, *Fluvic)	**1**
		d.Db	Haplic Planosols (Endocalcaric, *Fluvic)	**1**
Historische polders v Oostende				**11**
	Geulgronden			**4**
		n.G1	Endogleyic Fluvic Cambisols (Hypercalcaric, Clayic, *Drainic)	**1**
		n.G1z	Endogleyic Fluvic Cambisols (Hypercalcaric, *Loamic, *Drainic)	**1**
		n.G2	Gleyic Fluvic Cambisols (Hypercalcaric, Humic, Clayic, *Drainic)	**1**
		n.G3	Fluvic Gleysols (Hypercalcaric, Humic, Clayic, *Drainic)	**1**
	Kleiplaatgronden			**7**
		n.K1	Endogleyic Fluvic Cambisols (Hypercalcaric, Epiclayic, Endoloamic, Polyruptic)	**1**
		n.K1a	Endogleyic Fluvic Cambisols (Hypercalcaric, Epiclayic, Endoloamic, Endoruptic)	**1**
		n.K1l	Endogleyic Fluvic Cambisols (Hypercalcaric, Epiclayic, Endoloamic, Endoruptic)	**1**
		n.K2	Endogleyic Fluvic Cambisols (Hypercalcaric, Clayic, Bathyloamic, Bathyruptic, *Drainic)	**1**
		n.K2a	Endogleyic Fluvic Cambisols (Hypercalcaric, Clayic, Bathyruptic, *Drainic)	**1**

Landschap	Landeenheid	Code	Soil Unit (WRB-2007)	n
		n.K3	Endogleyic Fluvic Cambisols (Hypercalcaric, Humic, Clayic)	1
		n.K3z	Endogleyic Fluvic Cambisols (Hypercalcaric, Humic, Epiclayic, Endoarenic, Endoruptic)	1
Landschap van de Moeren				**19**
	Gronden op kleiig materiaal			**6**
		r.El	Fluvic Gleysols (Hypercalcaric, Humic, Siltic/Loamic, *Drainic)	1
		r.Elz	Fluvic Gleysols (Hypercalcaric, Humic, Siltic/Loamic, *Drainic, *Endoruptic)	1
		r.Em	Endogleyic Fluvic Cambisols (Hypercalcaric, Humic, Siltic/Loamic, *Drainic)	1
		r.Emz	Endogleyic Fluvic Cambisols (Hypercalcaric, Humic, Siltic/Loamic, *Drainic, *Ruptic)	1
		r.En	Endogleyic Endosalic Fluvic Cambisols (Hypercalcaric, Humic, Siltic/Loamic, *Drainic)	1
		r.sEl	Fluvic Gleysols (Hypercalcaric, Siltic/Loamic, Drainic, *Endoruptic)	1
	Gronden op zandig materiaal			**6**
		r.Sl	Fluvic Gleysols (Calcaric, *Loamic, *Drainic, *Endoruptic)	1
		r.Sly	Fluvic Gleysols (Calcaric, *Loamic, *Drainic, *Endoruptic)	1
		r.Sm	Endogleyic Fluvic Cambisols (Calcaric, Humic, *Loamic, *Drainic)	1
		r.Smy	Endogleyic Fluvic Cambisols (Calcaric, Humic, *Loamic, *Drainic, *Ruptic)	1
		r.uSl	Endogleyic Planosols (Hypercalcaric, *Humic, *Fluvic, *Loamic, *Amphiclayic, *Bathyarenic, *Drainic)	1
		r.uSm	Endogleyic Planosols (Hypercalcaric, *Humic, *Fluvic, *Loamic, *Amphiclayic, *Bathyarenic, *Drainic)	1
	Gronden op zandlemig materiaal			**7**
		r.Pl	Fluvic Gleysols (Hypercalcaric, *Loamic, Drainic, *Endoruptic)	1
		r.Pm	Endogleyic Fluvic Cambisols (Calcaric, Humic, *Loamic, *Drainic)	1
		r.Pn	Endogleyic Endosalic Fluvic Cambisols (Hypercalcaric, Humic, *Loamic, *Drainic)	1
		r.sPl	Fluvic Gleysols (Hypercalcaric, *Loamic, Drainic, *Endoruptic)	1
		r.sPm	Endogleyic Fluvisols (Hypercalcaric, *Ruptic, *Loamic, Endoarenic, *Drainic,)	1
		r.uPl	Endogleyic Planosols (Hypercalcaric, *Humic, *Fluvic, *Loamic, *Amphiclayic, *Bathyarenic, *Drainic)	1
		r.uPm	Endogleyic Planosols (Hypercalcaric, *Humic, *Fluvic, *Loamic, *Amphiclayic, *Bathyarenic, *Drainic)	1

Landschap	Landeenheid	Code	Soil Unit (WRB-2007)	n
Middelland				**41**
	Dekkleigronden			**2**
		m.E1	Endogleyic Fluvic Cambisols (Calcaric, Humic, Endoruptic, Bathyclayic)	**1**
		m.E1l	Endogleyic Fluvic Cambisols (Calcaric, Humic, Endoruptic, Endoclayic)	**1**
	Geulgronden			**6**
		m.G1	Endogleyic Fluvic Cambisols (Hypercalcaric, Humic, Clayic, Endoruptic, *Drainic)	**2**
		m.G2	Gleyic Fluvic Cambisols (Hypercalcaric, Humic, Clayic, *Drainic)	**2**
		m.G3	Fluvic Gleysols (Hypercalcaric, Humic, Clayic, *Drainic)	**2**
	Overdekte kreegruggronden			**16**
		m.D1	Fluvic Cambisols (Hypercalcaric, *Epiloamic, Endoarenic, *Polyruptic)	**1**
		m.D2	Fluvic Cambisols (Hypercalcaric, *Epiloamic, Endoarenic, *Polyruptic)	**1**
		m.D3	Endogleyic Fluvic Cambisols (Hypercalcaric, *Epiloamic, Endoarenic, *Polyruptic)	**1**
		m.D4	Endogleyic Fluvic Cambisols (Hypercalcaric, Loamic, Clayic, *Polyruptic)	**1**
		m.D4l	Endogleyic Fluvic Cambisols (Hypercalcaric, Loamic, Clayic, *Polyruptic)	**1**
		m.D5	Endogleyic Fluvic Cambisols (Hypercalcaric, Loamic, Clayic, *Polyruptic)	**1**
		m.D5l	Endogleyic Fluvic Cambisols (Hypercalcaric, Loamic, Clayic, *Polyruptic)	**1**
		m.Df1	Endogleyic Fluvic Cambisols (Hypercalcaric, Loamic, Clayic, *Polyruptic)	**1**
		m.Dk4	Endogleyic Fluvic Cambisols (Hypercalcaric, Loamic, Clayic, Endoarenic, *Polyruptic)	**1**
		m.Dk5	Endogleyic Fluvic Cambisols (Hypercalcaric, Loamic, Clayic, Endoarenic, *Polyruptic)	**1**
		m.Dk6	Endogleyic Fluvic Cambisols (Hypercalcaric, Loamic, Clayic, Endoarenic, *Polyruptic)	**1**
		m.Dl2	Endogleyic Fluvic Cambisols (Hypercalcaric, Loamic, Clayic, Endoarenic, *Polyruptic)	**1**
		m.Dl3	Endogleyic Fluvic Cambisols (Hypercalcaric, Loamic, Clayic, Endoarenic, *Polyruptic)	**1**
		m.Dl4	Endogleyic Fluvic Cambisols (Hypercalcaric, Loamic, Clayic, Endoarenic, *Polyruptic)	**1**
		m.Dl5	Endogleyic Fluvic Cambisols (Hypercalcaric, Loamic, Clayic, Endoarenic, *Polyruptic)	**1**
		m.Dl6	Endogleyic Fluvic Cambisols (Hypercalcaric, Loamic, Clayic, Endoarenic, *Polyruptic)	**1**

Landschap	Landeenheid	Code	Soil Unit (WRB-2007)	n
	Overdekte poelgronden			**17**
		m.F1	Gleyic Fluvic Cambisols (Endocalcaric, Clayic, Humic)	**1**
		m.F2	Thaptohistic Fluvic Gleysols (Calcaric, Humic, Clayic)	**1**
		m.Fc1	Fluvic Gleysols (Humic, Clayic)	**1**
		m.Fc2	Thaptohistic Fluvic Gleysols (Humic, Clayic)	**1**
		m.Fc3	Thaptohistic Fluvic Gleysols (Humic, Clayic)	**1**
		m.Fk1	Endogleyic Fluvic Cambisols (Calcaric, Clayic)	**1**
		m.Fk1d	Endogleyic Fluvic Cambisols (Calcaric, Clayic, Endoruptic)	**1**
		m.Fk2	Thaptohistic Fluvic Gleysols (Calcaric, Humic, Clayic)	**1**
		m.Fk3	Endogleyic Fluvic Cambisols (Calcaric, Clayic)	**1**
		m.Fk3d	Endogleyic Fluvic Cambisols (Calcaric, Clayic, Endoruptic)	**1**
		m.Fk4	Thaptohistic Fluvic Gleysols (Calcaric, Humic, Clayic)	**1**
		m.Fl1	Gleyic Fluvic Cambisols (Endocalcaric, *Loamic, Endoruptic, Endoclayic, Humic)	**1**
		m.Fl1d	Gleyic Fluvic Cambisols (Endocalcaric, *Loamic, Endoruptic, Endoclayic, Humic)	**1**
		m.Fl2	Thaptohistic Fluvic Gleysols (Calcaric, Clayic)	**1**
		m.Fl3	Endogleyic Fluvic Cambisols (Calcaric, Clayic, Endoruptic)	**1**
		m.Fl3d	Endogleyic Fluvic Cambisols (Calcaric, *Loamic)	**1**
		m.Fl4	Thaptohistic Fluvic Gleysols (Calcaric, *Loamic)	**1**
Nieuwland				**8**
	Schorgronden			**3**
		n.B1	Endogleyic Fluvic Cambisols (Hypercalcaric, Loamic, Endoarenic, Polyruptic)	**1**
		n.B2	Endogleyic Fluvic Cambisols (Hypercalcaric, Loamic, Endoarenic, Polyruptic)	**1**
		n.B3	Endogleyic Fluvic Cambisols (Hypercalcaric, Loamic, Bathyarenic, Polyruptic)	**1**
	Strandruggronden			**5**
		n.A1	Brunic Arenosols (Hypereutric)	**1**

Landschap	Landeenheid	Code	Soil Unit (WRB-2007)	n
		n.A1h	Endogleyic Brunic Arenosols (Hypereutric)	1
		n.A2	Brunic Cambisols (Hypereutric, Loamic)	1
		n.A2k	Fluvic Planosols (Hypereutric, Epiloamic, Endoclayic, Endoruptic)	1
		n.A2z	Fluvic Cambisols (Hypereutric, Epiloamic, Endoarenic, Endoruptic)	1
Nieuwland vh Zwin				**12**
	Lichte schorgronden			**1**
		z.Ba	Endogleyic Fluvic Cambisols (Hypercalcaric, Loamic)	1
	Zeer zware schorgronden			**5**
		z.Bc0	Endogleyic Fluvic Cambisols (Hypercalcaric, Epiloamic, Endoarenic, Endoruptic)	1
		z.Bc1	Endogleyic Fluvic Cambisols (Hypercalcaric, Clayic)	1
		z.Bc1k	Endogleyic Fluvic Cambisols (Hypercalcaric, Loamic)	1
		z.Bc2	Endogleyic Fluvic Cambisols (Hypercalcaric, Epiloamic, Endoarenic, Endoruptic)	1
		z.Bc3	Endogleyic Fluvic Cambisols (Hypercalcaric, Loamic)	1
	Zware schorgronden			**6**
		z.Bb1	Endogleyic Fluvic Cambisols (Hypercalcaric, *Loamic, Endoruptic)	1
		z.Bb1k	Endogleyic Fluvic Cambisols (Hypercalcaric, Loamic)	1
		z.Bb2	Endogleyic Fluvic Cambisols (Hypercalcaric, Epiloamic, Endoarenic, Endoruptic)	1
		z.Bb2k	Endogleyic Fluvic Cambisols (Hypercalcaric, Loamic)	1
		z.Bb3	Endogleyic Fluvic Cambisols (Hypercalcaric, Loamic)	1
		z.Bb3k	Endogleyic Fluvic Cambisols (Hypercalcaric, *Loamic, Endoruptic)	1
Oudland				**45**
	Gronden van de lage Moeren			**3**
		m.M1	Endogleyic Brunic Arenosols (Eutric, *Humic, *Drainic)	1
		m.M2	Endogleyic Fluvisols (Humic, Eutric, *Epiclayic, *Endoarenic, *Ruptic, *Drainic)	1
		m.M3	Endogleyic Fluvic Phaeozems over Arenosols (Humic, Ruptic, *Epiloamic, * Endoarenic, *Drainic)	1

Landschap	Landeenheid	Code	Soil Unit (WRB-2007)	n
	Kalkarme poelgronden			**3**
		m.Bk1	Fluvic Gleysols (Hypereutric, Humic, Clayic, *Drainic)	**1**
		m.Bk2	Fluvic Thaptohistic Gleysols (Hypereutric, Humic, Clayic, *Drainic)	**1**
		m.Bk3	Fluvic Thaptohistic Gleysols (Hypereutric, Humic, Clayic, *Drainic)	**1**
	Kreegruggronden			**10**
		m.A0	Endogleyic Fluvic Cambisols (Calcaric, *Loamic)	**1**
		m.A1	Endogleyic Fluvic Cambisols (Calcaric, *Loamic, Endoruptic)	**1**
		m.A2	Endogleyic Fluvic Cambisols (Calcaric, Endoruptic, Endoarenic, *Loamic)	**1**
		m.A3	Endogleyic Fluvic Cambisols (Calcaric, Endoruptic, Endoarenic, *Loamic)	**1**
		m.A4	Endogleyic Fluvic Cambisols (Calcaric, Siltic/Loamic, Humic, Endoruptic)	**1**
		m.A4l	Endogleyic Fluvic Cambisols (Calcaric, Loamic, Humic, Endoruptic)	**1**
		m.A5	Endogleyic Fluvic Cambisols (Calcaric, Siltic, Endoruptic, Endoarenic)	**1**
		m.A5l	Endogleyic Fluvic Cambisols (Calcaric, Siltic/Loamic, Endoruptic)	**1**
		m.A6	Endogleyic Fluvic Cambisols (Calcaric, Siltic, Bathyruptic)	**1**
		m.Ab1	Endogleyic Fluvic Cambisols (Calcaric, Siltic, Endoruptic, Endoarenic)	**1**
	Kunstmatige gronden			**18**
		OA	Endogleyic Fluvic Cambisols (Calcaric, Loamic)	**1**
		OC	Terric Anthrosols (Hypercalcaric)	**1**
		OD	Technosols / not survey	**1**
		OE1	Endogleyic Fluvic Cambisols (Calcaric, Loamic)	**1**
		OE2	Endogleyic Fluvic Cambisols (Calcaric, Clayic)	**1**
		OG1	Gleyic Fluvic Cambisols/Arenosols (Hypercalcaric, Epiloamic, Endoarenic, Endoruptic)	**1**
		OG2	Fluvic Gleysols (Calcaric, Clayic)	**1**
		OL	Endogleyic Fluvic Cambisols (Calcaric, Loamic)	**1**
		ON	Technosols / not survey	**1**

Landschap	Landeenheid	Code	Soil Unit (WRB-2007)	n
		OO	Endogleyic Fluvic Cambisols (Calcaric, Loamic, Bathyarenic)	1
		OO1	Endogleyic Fluvic Cambisols (Calcaric, Loamic, Bathyarenic)	1
		OO2	Endogleyic Fluvic Cambisols (Calcaric, Loamic, Bathyarenic)	1
		OO3	Endogleyic Fluvic Planosols (Hypereutric, Epiloamic, Endoclayic, Endoruptic)	1
		OO4	Endogleyic Fluvic Planosols (Calcaric, Loamic, Ruptic, Bathyarenic)	1
		OT	Technosols / not survey	1
		OV1	Endogleyic Fluvic Cambisols (Hypercalcaric, Humic, *Loamic, *Drainic, *Thaptohistic)	1
		OV2	Endogleyic Fluvic Cambisols (Hypercalcaric, Humic, Clayic, *Drainic, *Thaptohistic)	1
		OZ	Endogleyic Fluvic Cambisols (Hypercalcaric, Epiloamic, Endoarenic, Endoruptic, *Drainic)	1
	Oude kleiplaatgronden			3
		m.C1	Endogleyic Fluvic Cambisols (Hypercalcaric, Clayic, *Drainic)	1
		m.C2	Endogleyic Fluvic Cambisols (Hypercalcaric, Humic, Clayic, *Drainic)	1
		m.C3	Endogleyic Fluvic Cambisols (Hypercalcaric, Humic, Clayic, Endoruptic, *Drainic)	1
	Overdekte waddengronden			4
		m.W1	Endogleyic Fluvic Cambisols (Hypercalcaric, Humic, Epiclayic, Endoarenic, Drainic, *Ruptic)	1
		m.W2	Endogleyic Fluvic Cambisols (Hypercalcaric, Humic, Loamic, Endoruptic)	1
		m.W2k	Endogleyic Fluvic Cambisols (Hypercalcaric, Humic, Epiloamic, Endoclayic, Endoruptic)	1
		m.W2z	Endogleyic Fluvic Cambisols (Hypercalcaric, Humic, Epiloamic, Endoarenic, Endoruptic)	1
	Poelgronden			4
		m.B1	Endogleyic Fluvic Cambisols (Humic, Eutric, Siltic, *Drainic)	1
		m.B2	Endogleyic Fluvic Cambisols (Eutric, Clayic, *Drainic, *Thaptohistic)	1
		m.B3	Gleyic Fluvic Cambisols (Eutric, Clayic, *Drainic, *Thaptohistic)	1
		m.B4	Rheic Sapric Histosols (Calcaric, Novic, Arenic)	1
Oudland (overgangsgronden)				21

Landschap	Landeenheid	Code	Soil Unit (WRB-2007)	n
	Overdekt tertiaire gronden			**4**
		m.T3	Endogleyic Fluvic Planosols (Hypereutric, Epiloamic, Endoclayic, Endoruptic)	**1**
		m.T4	Endogleyic Fluvic Planosols (Hypereutric, Epiloamic, Endoclayic, Endoruptic)	**1**
		m.T6	Endogleyic Fluvic Cambisols (Humic, Epiclayic, Endoloamic, Polyruptic)	**1**
		m.Tb2	Fluvic Thaptohistic Gleysols (Hypereutric, Humic, Clayic, *Drainic)	**1**
	Overdekt-Pleistocene gronden			**17**
		m.P1	Endogleyic Regosols (Eutric, Epiloamic, Endoarenic, Endoruptic)	**1**
		m.P2	Endogleyic Regosols (Eutric, Epiloamic, Endoarenic, Endoruptic)	**1**
		m.P3	Endogleyic Phaeozems (Epiloamic, Endosiltic, Polyruptic, *Fluvic)	**1**
		m.P4	Endogleyic Planosols (Hypereutric, Humic, Clayic, Endosiltic, Polyruptic)	**1**
		m.P5	Endogleyic Fluvic Stagnosols (Hypereutric, Humic, Epiclayic, Endosiltic, Ruptic)	**1**
		m.P6	Endogleyic Fluvic Cambisols (Calcaric, Humic, *Loamic, *Endoclayic, Drainic, *Endoruptic)	**1**
		m.P6k	Endogleyic Fluvic Cambisols (Calcaric, Humic, *Loamic, *Endoclayic, Drainic, *Endoruptic)	**1**
		m.P6l	Endogleyic Fluvic Cambisols (Calcaric, Humic, *Loamic, Drainic, *Endoruptic)	**1**
		m.P7	Endogleyic Planosols (Calcaric, Humic, Loamic, Endoclayic)	**1**
		m.Pb1	Thaptohistic Fluvic Gleysols (Hypereutric, Humic, Epiclayic, Endoarenic, Endoruptic)	**1**
		m.Pb2	Thaptohistic Fluvic Gleysols (Hypereutric, Humic, Epiclayic, Endoarenic, Endoruptic)	**1**
		m.Pb3	Thaptohistic Fluvic Gleysols (Hypereutric, Humic, Epiclayic, Endoarenic, Endoruptic)	**1**
		m.Pk2	Endogleyic Fluvic Cambisols (Hypereutric, Epiloamic, Endoarenic, Polyruptic)	**1**
		m.Pk4	Endogleyic Fluvic Cambisols (Hypereutric, Epiloamic, Endoarenic, Polyruptic)	**1**
		m.Pl1	Endogleyic Fluvic Cambisols (Hypereutric, Epiloamic, Endoarenic, Polyruptic)	**1**
		m.Pl2	Endogleyic Fluvic Planosols (Hypereutric, Epiloamic, Endoclayic, Endoruptic)	**1**
		m.Pl4	Endogleyic Fluvic Planosols (Hypereutric, Epiloamic, Endoclayic, Endoruptic)	**1**
Grand Total				**166**

Annex 5 – Conversion of the 200 most common soil types (in terms of area) to WRB-2014 Reference Soil Groups with two first Principal Qualifiers, grouped per soil district of the Flemish region

RSG_2014	PQ1	PQ2	SDISTRICT	STYPE	n
Anthrosols					**17**
	Plaggic				**6**
			Depressie van de Netes		**3**
				Zbm	1
				Zcm	1
				Zdm	1
			Kempische cuesta		**3**
				Sdm	1
				Zcm	1
				Zdm	1
	Terric				**11**
			Centrale Vlaamse laagvlakte		**4**
				Zbh	1
				Zch	1
				Zcm	1
				Zdh	1
			Oostelijke Boomse cuesta		**1**
				Scm(g)	1
			Westelijke Boomse cuesta		**1**
				Scm	1
			West-Vlaams cuestaland		**4**
				Sch	1
				Sdh	1
				Zch	1
				Zdh	1
			Zuidelijke Vlaamse laagvlakte		**1**
				Zch	1
Arenosols					**11**
	Brunic				**4**
			Maasterrassen		**3**
				Zbf	1
				Zbf1t	1
				Zbft	1
		Eutric			**1**
			Zuidelijke Vlaamse laagvlakte		**1**
				Zcc(h)	1
	Gleyic				**1**
		Eutric			**1**
			Centrale Vlaamse laagvlakte		**1**
				Zdb	1
	Protic				**6**
		Calcaric			**1**
			Kustvlakte, Duinstreek		**1**
				d.A0	1
		Dystric			**5**
			Centrale Vlaamse laagvlakte		**1**
				X	1

RSG_2014	PQ1	PQ2	SDISTRICT	STYPE	n
			Depressie van de Netes		1
				X	1
			Heuvelland van Lummen		1
				X	1
			Kempische cuesta		1
				X	1
			Maasterrassen		1
				X	1
Cambisols					47
	Dystric				1
			Maasterrassen		1
				Scft	1
	Eutric				5
			Brabants plateau		1
				Abp	1
			Dender-Zenne interfluvium		1
				Acp	1
			Plateau van Haspengouw		2
				AbB	1
				Abp	1
			Schelde-Dender interfluvium		1
				Acp	1
	Fluvic				1
		Eutric			1
			Vlakte van de Maas		1
				Lbp	1
	Gleyic				34
		Eutric			8
			Brabants plateau		1
				Ldp	1
			Centrale Vlaamse laagvlakte		3
				Sep	1
				Sdb	1
				SdP	1
			Schelde-Dender interfluvium		2
				Adp	1
				Ldp	1
			West-Vlaams cuestaland		2
				Sep	1
				Pep	1
		Fluvic			26
			Brabants plateau		1
				Eep	1
			Depressie van de Netes		1
				Sepz	1
			Kustvlakte, Middelland		3
				m.D5	1
				m.E1	1
				m.F1	1
			Kustvlakte, Nieuwland vh Zwin		1

RSG_2014	PQ1	PQ2	SDISTRICT	STYPE	n
				z.Bb2	1
			Kustvlakte, Oudland		7
				m.A4	1
				m.A5	1
				m.B1	1
				m.C1	1
				m.C2	1
				OV1	1
				OV2	1
			Kustvlakte, Oudland (overgangsgronden)		1
				m.P6	1
			Oostelijke Vlaamse laagvlakte		1
				Eep	1
			Plateau van Haspengouw		2
				Adp	1
				Aep	1
			Polder-Leie interfluvium		2
				Ldp	1
				Lep	1
			Schelde-Dender interfluvium		1
				Aep	1
			Scheldepolders		1
				Uep	1
			Urban / Not mapped		2
				Eep	1
				Udp	1
			Zuidelijke Vlaamse laagvlakte		3
				Eep	1
				Ldp	1
				Lep	1
	Leptic				1
		Dystric			1
			Hagelands heuvelland		1
				ZAfe	1
	Terric				5
			Centrale Vlaamse laagvlakte		1
				ZcP	1
			West-Vlaams cuestaland		1
				Zcg	1
		Gleyic			3
			Centrale Vlaamse laagvlakte		2
				SdP	1
				ZdP	1
			West-Vlaams cuestaland		1
				SdP	1
Histosols					2
	Sapric				2
		Rheic			2
			Heuvelland van Lummen		1
				V	1

RSG_2014	PQ1	PQ2	SDISTRICT	STYPE	n
			Maasterrassen		1
				V	1
Luvisols					27
	Gleyic				3
			Hagelands heuvelland		1
				Ldp(c)	1
			Leie-Schelde interfluvium		1
				Ada	1
			Polder-Leie interfluvium		1
				Ada	1
	Haplic				14
			Brabants plateau		1
				Lca	1
			Dender-Zenne interfluvium		2
				Abp(c)	1
				Acp(c)	1
			Hagelands heuvelland		4
				Lbp(c)	1
				Lca	1
				Lca0	1
				wLca	1
			Leie-Schelde interfluvium		1
				Lca	1
			Plateau van Haspengouw		2
				Aba0	1
				Abp(c)	1
			Polder-Leie interfluvium		1
				Lca	1
			Schelde-Dender interfluvium		2
				Aba0	1
				Lba	1
			Zuidelijke Vlaamse laagvlakte		1
				Lca	1
	Nudiargic				8
			Brabants plateau		2
				Aba1	2
			Dender-Zenne interfluvium		2
				Aba1	1
				Aca1	1
			Plateau van Haspengouw		1
				Aba1	1
			Schelde-Dender interfluvium		2
				Aba1	1
				Aca1	1
			Urban / Not mapped		1
				Aba1	1
	Stagnic				2
		Nudiargic			2
			Dender-Zenne interfluvium		1
				ADa1	1
			Schelde-Dender interfluvium		1

RSG_2014	PQ1	PQ2	SDISTRICT	STYPE	n
				ADa1	1
Phaeozems					**3**
	Gleyic				**3**
		Fluvic			**2**
			Dender-Zenne interfluvium		**1**
				Aep	1
			Polder-Leie interfluvium		**1**
				Eep	1
		Luvic			**1**
			Hagelands heuvelland		**1**
				Afa	1
Planosols					**2**
	Retic				**2**
		Eutric			**2**
			Polder-Leie interfluvium		**2**
				uLhc	1
				u-Lhc	1
Podzols					**28**
	Albic				**11**
			Centrale Vlaamse laagvlakte		**2**
				Zbg	1
				Zcg	1
			Depressie van de Netes		**1**
				Zcg	1
			Kempische cuesta		**2**
				Zcg	1
				Zcgb	1
			Maasterrassen		**5**
				t-Zcg	1
				Zbg	1
				Zbg1t	1
				Zcg	1
				Zcgt	1
			West-Vlaams cuestaland		**1**
				Zcg	1
	Gleyic				**17**
			Centrale Boomse cuesta		**1**
				Zdg	1
			Depressie van de Netes		**3**
				Zdg	1
				Zeg	1
				Zegb	1
			Heuvelland van Lummen		**1**
				Zdg	1
			Kempische cuesta		**6**
				w-Seg	1
				Zdg	1
				Zdgb	1
				Zdgy	1
				Zeg	1

RSG_2014	PQ1	PQ2	SDISTRICT	STYPE	n
				Zegb	1
			Maasterrassen		**4**
				Sdg	1
				t-Zdg	1
				Zdg	1
				Zeg	1
			Vlak van Zonhoven		**2**
				Zdg	1
				Zeg	1
Retisols					**31**
	Eutric				**6**
			Oostelijke Vlaamse laagvlakte		**1**
				Pcc	1
			Polder-Leie interfluvium		**2**
				Pbc	1
				Pcc	1
			Zuidelijke Vlaamse laagvlakte		**3**
				Pbc	1
				Pcc	1
				Sbc	1
	Fragic				**1**
		Glossic			**1**
			Brabants plateau		**1**
				Abc0	1
	Gleyic				**19**
		Dystric			**1**
			Brabants plateau		**1**
				Ldc	1
		Eutric			**18**
			Centrale Boomse cuesta		**2**
				Ldcz	1
				Pdcz	1
			Dender-Zenne interfluvium		**1**
				Ldcz	1
			Leie-Schelde interfluvium		**1**
				Ldc	1
			Oostelijke Vlaamse laagvlakte		**3**
				Ldc	1
				Ldcz	1
				Pdc	1
			Plateau van Haspengouw		**1**
				Ldcz	1
			Polder-Leie interfluvium		**5**
				Ldc	1
				Ldcz	1
				Pdc	1
				w-Ldc	1
				w-Pdc	1
			Schelde-Dender interfluvium		**1**
				Ldc	1

RSG_2014	PQ1	PQ2	SDISTRICT	STYPE	n
			Urban / Not mapped		1
				Pdcz	1
			Westelijke Boomse cuesta		1
				Ldc	1
			Zuidelijke Vlaamse laagvlakte		2
				Ldc	1
				Pdc	1
	Neocambic				2
		Eutric			2
			Brabants plateau		1
				Aba0(b)	1
			Plateau van Haspengouw		1
				Aba0(b)	1
	Nudiargic				1
		Eutric			1
			Brabants plateau		1
				Aba1(b)	1
	Stagnic				2
		-			2
			Hagelands heuvelland		1
				Lhc	1
			Polder-Leie interfluvium		1
				Lhc	1
Stagnosols					3
	Retic				3
		Eutric			3
			Plateau van Haspengouw		2
				Lhc	1
				Lhcz	1
			Polder-Leie interfluvium		1
				w-Lhc	1
Umbrisols					1
	Gleyic				1
		Fluvic			1
			Depressie van de Netes		1
				Sep3z	1
Grand Total					200